

CAP

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COMPUTER ACCESSORIES AND PERIPHERALS
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(Top row L to R: Super Slave 128, HDC-1001, Super Slave 64, Bottom row L to R: Super Quad, Super 186, Super Six)

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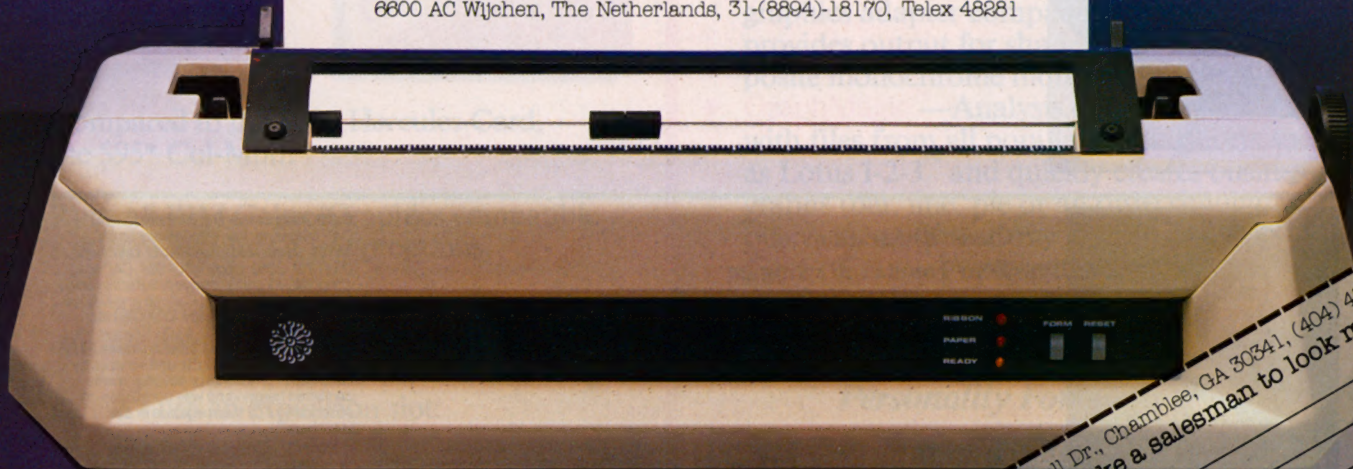
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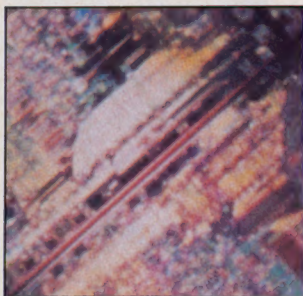
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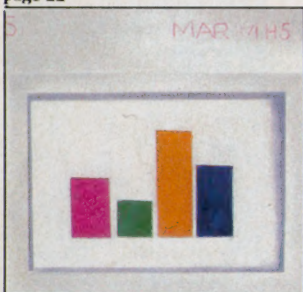
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By Neil Lipson and Hartley G. Lesser

Expand your business computer with boards that will provide features such as print buffering, disk emulation and more memory.



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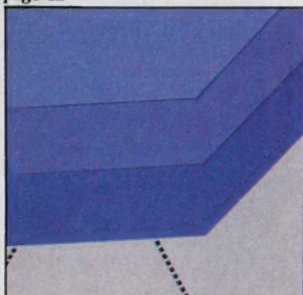
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Harold Lee, microprocessor pioneer and industry mover has a FREE offering for CAP readers.

- 74 Unix Primer**
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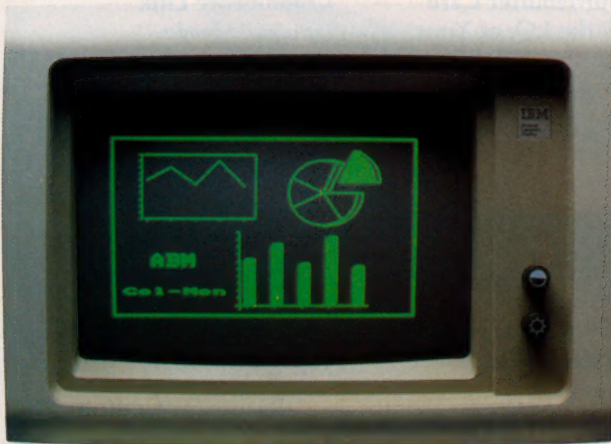
A look ahead at the impact of the Unix operating system on the business marketplace.



Cover Illustration:
Tom Tomita's drawing on the cover depicts the unlimited areas opened by memory expansion boards.

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A picture is worth a thousand words. In color, maybe two thousand



...with ABM's \$95 Col-Mon™

The Col-Mon™ (Color to Monochrome Adapter) is an interface module that plugs into the RGB output of the color card. It converts the signals from the IBM or compatible color board so graphics and text can be displayed on the IBM monochrome monitor.

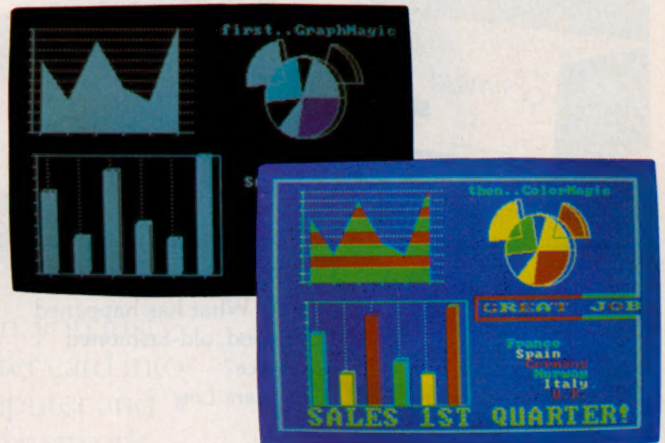


Compared to the \$499 Hercules Card, the \$95* Col-Mon:™

- Runs all IBM Color/Graphics compatible software, not just a few programs.
- Can be configured so both a color and monochrome display work simultaneously.
- Doesn't use an expansion slot.

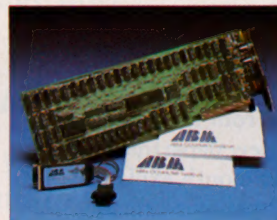
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COMPUTER ACCESSORIES & PERIPHERALS

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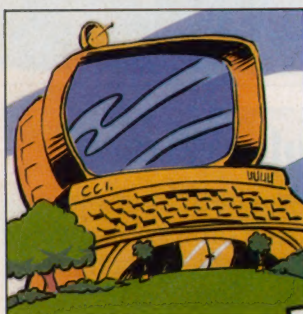
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What every PC network should be.



Simple.

Anybody in your office should be able to use your network. That's how we designed OmniShare.

OmniShare™ software lets any IBM XT or compatible share its disc space with other PC's or compatibles. All it takes is one transporter card per computer, plus the wire to connect them.

Then you just put in one floppy, answer one question and you've got a working network. It's that simple.

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Because when you need to add storage and backup, you'll find that Corvus has

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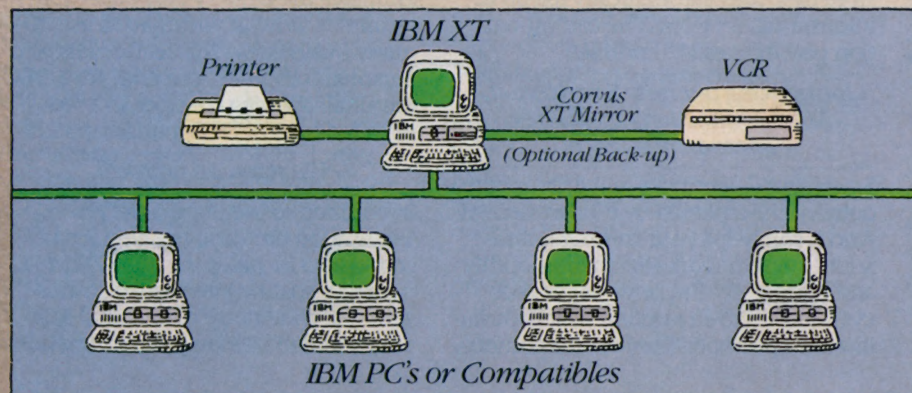
Dependable.

Of all the networks around, how many are really proven? We think the facts speak for themselves: Corvus networks now connect 3 out of every 5 locally-networked micros*.

If you'd like to hear more, just call us at 800-4-CORVUS.

We really believe a PC network should be like a rubber band. Simple. Expandable. Affordable. Dependable.

And that's not stretching the point.



CORVUS
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*Hayes. Leading the way
with quality telecomputing
systems for the personal
computers that businesses
use most.*

When it comes to communicating—computer to computer—Hayes says it best. All you need is a Hayes Smartmodem (it's like a telephone for your computer) and Smartcom II™ software, to get you into all the right places.

In no time at all, and with no assistance at all, you can create, send and store files, and automatically log on to information services. The communication possibilities are endless!

*Introducing our new Smartcom II.
More connection capabilities.
More convenience.*

Smartcom II continues to maximize the outstanding capabilities of Smartmodem. And it still helps your computer and Smartmodem work together, smoothly and effortlessly. But now Hayes goes even further to streamline your communications and optimize your connections.

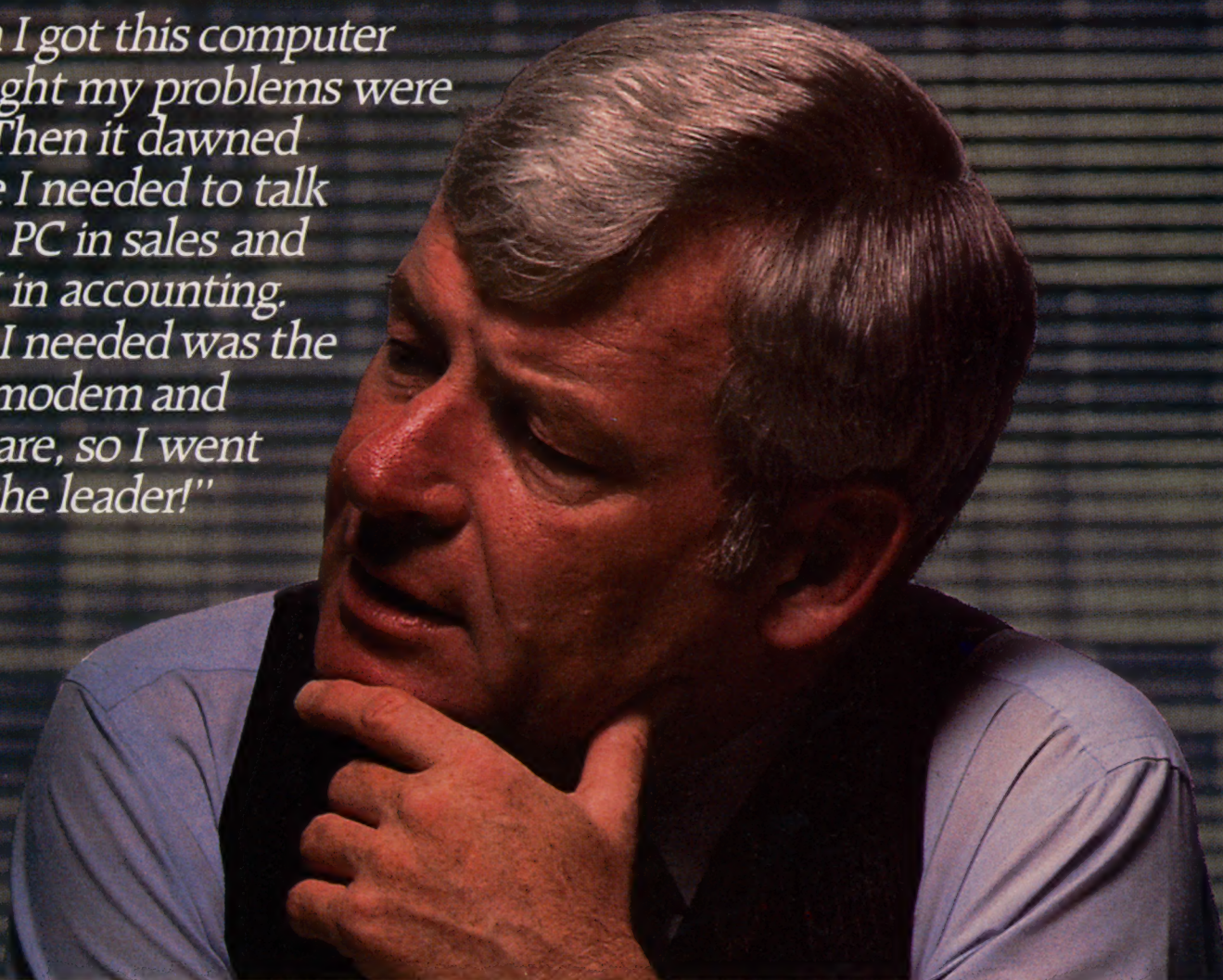
Smartcom II software is currently available for more than 12 personal computers (with even more to come). That means you can communicate, Smartcom to Smartcom, with an IBM PC, DEC Rainbow 100, HP 150, TI Professional Computer* and others.

And that's not all! Smartcom II also emulates the DEC* VT100 and VT52 terminals, now in widespread use in many businesses. This feature lets your personal computer "pretend" it's a DEC terminal, opening the door to a vast installed base of DEC minicomputers!

We stand on protocol.

In addition to the popular Hayes Verification protocol, the new Smartcom II also includes the XMODEM protocol, ensuring accurate transmission to a wide range of personal computers and mainframes at information

"When I got this computer I thought my problems were over. Then it dawned on me I needed to talk to the PC in sales and the TI in accounting. What I needed was the right modem and software, so I went with the leader!"



services. By matching the protocol (or "language") of a remote computer to yours, Smartcom II can transmit information error-free, regardless of interference on the phone lines.

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Get your hands on the leader.

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(the first of the Smartmodem series) dials, answers and disconnects calls automatically. Smartmodem 1200™ and Smartmodem 1200B™ (it plugs into an expansion slot inside an IBM PC or compatible), provide high-speed, high-performance communications for businesses of all sizes.

And, when Smartmodem is purchased with Smartcom II, you have the most dependable telecomputing system available for your personal computer.

Everything we do at Hayes is designed to make communications easier for you. Feature-rich, direct connect modems. Menu-driven software. Concise documentation. And a customer service organization, second to none!

See your dealer right now for a hands-on demonstration of Smartmodem and our latest version of Smartcom II. From the telecomputing leader. Hayes.



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Mr. ChipsTM Plays Your PC Like a One Man Band



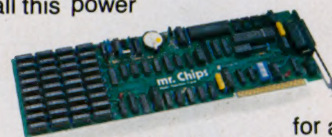
Mr. Chips, the new multi-function card from Orange Micro, adds a full ensemble of features to your IBM[®] PC. Memory, printer ports, and a clock are standard, and you'd expect them on a top quality board. But computing is changing.

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- **BSR[™]AC Line Controller*:** Control your lights, appliances, security systems, or anything that plugs into an AC wall socket.
- **Chipdisk RAM Disk:** Set your PC memory to act like a disk drive. Your programs will run much faster than with conventional disk drives.
- **Chipdisk Print Spooler:** Your PC memory will serve as a printer buffer, so you won't have to wait for your printer anymore.

*Cables available separately



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The Zipless Sale By Laura Lang

After dining out the other night, I thought a visit to the local computer store might prove interesting — to see what's new and how it's being sold. We'll call the store "MicroService." That one visit proved to be a revelation.

My friend and I wandered around the glowing, clicking and clattering machines for nearly an hour — and not one salesperson offered assistance. I sat down in front of an Apple Macintosh for 20 minutes and taught myself how to use the mouse to put a loaded program through its paces. I used a Lisa for nearly 30 minutes. I remained uninterrupted by MicroService employees during this entire time.

Where were the salespeople? Gathered about the register area planning their weekends. After all, it was a Friday night, and the shop would be closing shortly.

A salesman eventually approached me. Finally, I thought. But rather than ask if I had questions, interests or other observations about the computer I was running, he asked me to finish what I was doing so the store could close on time.

Obviously, this individual wasn't interested in earning any commissions from a sale. Perhaps he felt, or sensed, that my friend and I weren't really there to buy anything. But what if we

had been earnestly looking to purchase a computer system? Are many computer stores this lax in dealing with customers?

I purposely picked three nearby computer retail stores to survey their service. Although none were nearly as unattentive as my first experience, better customer service would more likely be found in a corner convenience store.

However, in one Los Angeles software store I found the type of sales service I was looking for. I had entered the store just behind a local businessman who was buying his first computer. He seemed a bit nervous about the entire procedure.

A salesman approached to help him, and I tagged along. The customer, we'll call him Bill, wanted a computer to handle his inventory, accounting and correspondence needs. I waited to hear the salesman's response with bated breath — was he pro-Apple, pro-IBM or an independent? Would he immediately push the most expensive package in the store?

The salesman explained he needed Bill to work up a concrete list of present and future needs. Then they would go over this list together and find the right equipment, help train Bill's employees in the use of the programs and even loan out equipment to make cer-

tain the item to be purchased fit Bill's needs. What a radical change from previous encounters!

This is the kind of service a consumer should expect from a computer store. If the store you go into doesn't take an interest in your purchase (i.e., your individual needs, future expansion considerations), then perhaps you should look elsewhere for this support. A checklist might be in order to aid in proper dealer selection:

1. Is the floor service prompt and courteous?
2. How knowledgeable are the salespeople?
3. What type of follow-up service do they offer?
4. How about the store's reputation and stability? You don't want to make a big purchase and come back next week to find they have gone out of business.
5. Are they willing to show you the component or software in which you are interested actually working with a system identical to the one you're planning to purchase or already own?
6. Do they fully understand your needs and are they competent in filling them?
7. Will they give you telephone advice after the sale should you have installation and start-up problems? What about training?
8. Do they do on-site repairs? For what systems?
9. Do you feel comfortable with them?
10. Is their location convenient to yours if you need to drop by the shop for accessories or bring in faulty or broken equipment? Do they deliver? Pick up?

Computer sales are big business. Good and courteous service ensures a continuing role for the computer retailer in today's microcomputer ownership explosion. ■



Illus. by Mike Goldberg

Service Contracts Are Useful If Not Misused

Editor:

I have just finished reading your article on service contracts in the June issue ("reduce breakdown time...") and as a service manager in a retail computer store I would like to set a few things straight.

CAP makes the statement "... Anything short of abuse is fair..." and then proceeds to recommend leaving on a computer all weekend. Well I've had customers who've done just that; 15 systems to be exact, in a closed-in room, with outside temperatures in excess of 85 degrees (no telling what the inside temperatures were) with all air conditioning off and no cooling fans on any of them. Now to me, that's abuse. I agree that a new computer owner owes it to her/himself to check out every function of their new equipment, but the more abuse you give it, the more likely you are to weaken otherwise good components, causing failures before or after the warranty period.

CAP then goes on to talk about levels of repair and makes it sound like all technicians are out to rip you off. As a techie with many years of experience, I try to do as many "scope and solder" repairs as possible, but in the long run this type of repair is not cost efficient to the customer. If I can isolate the problem part and replace it in half an hour, it can very often cost less than my having to pull out service manuals, set up a scope or other very expensive pieces of equipment, take the time to track down the offending component(s), de-solder (a tricky move on multi-level circuit boards), replace and re-solder the part, and then test again to make sure I've found all the bugs. If the problem is intermittent, as about 45-50% of problems usually are, you can multiply the testing time by several factors. All this does not, of course, take into effect shipping times for spare parts of any-

where from one to many weeks (I just can't stock every part in the world!).

In the retail computer world, service is generally not a money-making proposition. We are here to provide service and support to our customers. My labor rate for equipment purchased from our store is \$40/hr. and believe me, at that rate I ain't gettin' rich. In the past 6 months, we have done approximately 600-650 repairs, mostly under warranty, and the rest have an average labor charge of around \$35-50. Service contracts are, indeed, a worthwhile idea for the customer, as well as the service department, but not because the service technicians are rip-offs.

Spencer Parker
Computerland
Ithaca, NY

Editor:

I have read your article in the June issue about Quadram Quadlink and I found it to be most interesting. However, I was surprised to read about the unavailability of cables for Compaq and Columbia computers.

As a manufacturer of cables to the computer industry I would like to get the specs of these cables, so I would be able to offer the readers easy access to those hard-to-find cables. Again, I enjoyed your article.

Ben Blumenfeld
Ben-Tronics
Woodland Hills, CA

Ed. Note: Letters to Editorial should be addressed to: Editor, CAP Magazine, 24406 Borrego Ct. Laguna Niguel, CA 92677 (714) 643-1695

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**Thinking of
buying a modem?
You owe it
to yourself to check out the Qubie' 212A modems.**

Inside Outside

Just a few years ago, computers needed big air-conditioned rooms to operate in, balefuls of money to buy, and a team of wizards to keep them running. The constant march of technological progress has given more and more powerful machines which cost less and less. Desktop computers more powerful than the early mainframe computers are the result of the evolution. The Qubie' modems represent the latest extension of this progress. Because up until now, a 212A compatible modem cost at least \$500. Through the use of four low-cost, state of the art microprocessors, we can now offer two versions of our full featured 212A modem at prices the competition sells 300 baud modems for.

In The Beginning

In September of 1983 we introduced the first 212A modem card for the IBM PC available for under \$300. The PC212A/1200 is a complete communications package including PC-TALK III software, modular phone cable, card edge guide, and instruction manual. The modem is an auto-dial, auto-answer type, which uses all the Hayes software commands so it can be used with any of the popular software packages including Crosstalk™ and Smartcom™. We picked the best software package we could find based on it's ease of use and features, PC-TALK III. Our modem includes features the old industry standard missed out on. Like being able to fit in one slot in a Portable PC or PC/XT.

Or an optional connector to use the modem's serial port when not using the modem. Of course the topper is the \$299 price, hundreds less than the competition.

Now Available Outside

Our standalone modem, the 212E/1200 can be used with any computer or terminal with a RS-232C serial port. You can use any Hayes compatible communications software on anything from an Apple to a Zenith. Many owners of IBM PC's are using it because they lack available expansion slots, or have more than one computer they want to use their modem with.

It's attractive gold anodized case houses seven status lights (who says low prices means a shortage of features). It fits comfortably under a standard telephone. It is also a 212A compatible auto-dial, auto-answer modem which supports all Hayes software commands. Even the switch settings are the same, so any software giving recommended switch settings for a Hayes modem can be used, without knowing what the switches do. There is a volume control knob for easy adjustment of the speaker's output. Included in the package is modular phone cable, a cable to hook it to your computer or terminal, and instruction manual. Choose the communications package right for your needs, and you're ready to go!

Four Hearts

The heart of the Qubie' modems are four digital signal microprocessors. Two handle sending, and two do the receiving. Rather than attempt to filter all but the relevant tones used for modem communications, the

microprocessors measure the tones digitally. This allows them to overcome line noise and static better than analog filter based modems

Why Buy From Qubie'

Because you will get a product as good or better than any available, pay less for it, and get factory direct help if you need it. If at any time during the one year warranty period your modem should require service, we will fix it or replace it within 48 hours. Notice also there are no hidden charges in our prices. No extra for freight, insurance, credit cards, or COD fees. In a hurry? UPS 2nd day air service is just \$5 extra. If you are like many who say, "Nah, it's too good to be true," just apply the acid test and find out. Then you will be asking yourself, "Why should I pay what these modems used to cost?"

The Acid Test

Qubie' gives you a 30 day satisfaction guarantee on your modem. If you are not completely satisfied we will refund the entire amount of your purchase including the postage to return it. If you can, get anyone selling another modem to give you the same guarantee. Buy both, and return the one you don't like. We know which one you will keep.

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PC212A/1200 Includes: Modem Card, PC-TALK III software, card edge guide, modular phone cable, quick reference card, and instruction manual. **\$299**
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A Case for Consultants By William R. Howey

"I only sell them." How often have you heard that one? Business professionals are, unfortunately, given this answer all too frequently when a system goes down or a component in the system is not acting the way it should. In many cases the system was put together by the businessman or someone in the organization who was only familiar enough with computers to "get it running."

But this is not enough. Corporate heads, managers and employees rely on accurate and timely information for the decision making and daily work flow. If anything happens to slow down this process, the company faces problems.

Cost Factors

Microcomputers are cost effective when installed and operating error-free. Time spent with a problem component steals time away from employees, customers and top management. And this means wasted money — the bottom line of business. A recent salary survey shows that the average business manager earns about \$60 an hour. Time spent solving com-

puter malfunctions or installing a component is non-productive work-time, i.e., wasted time, and more.

Bargain components and software which can be purchased at 25 to 40% below cost may be an excellent buy for the home hobby market; but unless that price includes backup service and installation, business buyers should approach "bargains" carefully. The purchase price can ultimately climb by 500% and more. In addition to the initial cost of the product, you are wasting time shopping around for products and services.

One Fortune 500 company I was associated with retained a staff of 10 computer experts, who were responsible for finding and installing new microcomputer components with budget limitations in mind. However, when a \$500 purchase at 40% off from the manufacturer caused two of these experts to spend five hours reading manuals, making cables and calling the manufacturer twelve times in three days, the cost savings were nil.

The time spent finding a company to install and service equipment and train employees is time well spent. Usually

this means purchasing equipment at retail prices, which is a small price to pay in the long run.

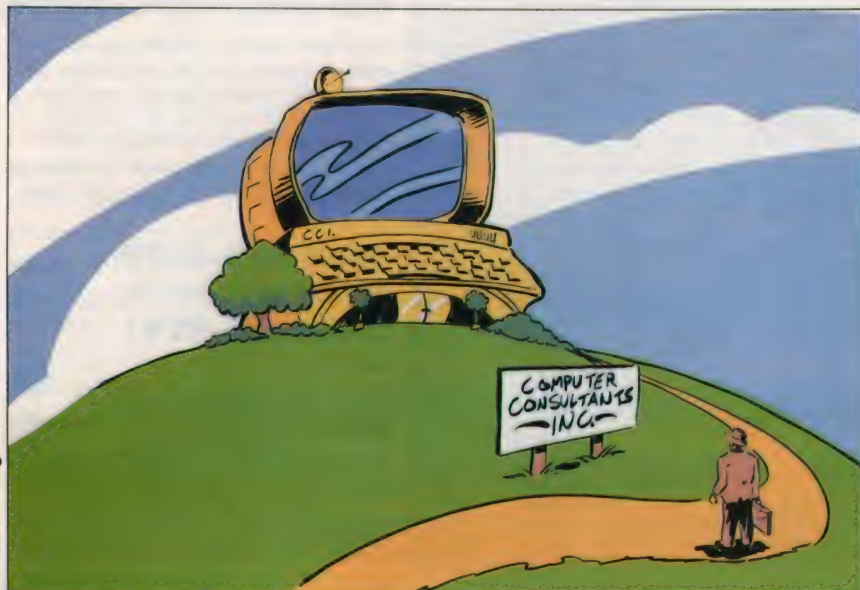
Getting Help

There are 10 steps to qualifying a company before they should set foot inside the doors of your business.

1. What are the qualifications of their employees?
2. Do they represent a nationally recognized brand of computers, components or software?
3. Do they sell hardware only or are they interested in digging into the needs of your company before they even mention hardware?
4. Do they take time to explain each step in the selection process without using complex terminology?
5. What type of training do they offer? Are there additional costs for each employee?
6. Do they offer on-site service? Is backup equipment available if your computer or peripheral must be taken into the shop for repairs?
7. Can they give references you can call to determine that company's level of satisfaction with their installation?
8. Can they prove that they can deliver on time all that they promise?
9. Are you comfortable with this company?
10. Can you trust this organization with the bottom line of your company?

If the answers to all of the above are yes, you have found an organization that is capable of taking on a job that can have a very positive effect on the way you do business. You are ready to hire them to take a very big load off your mind.

So be forewarned! Take time to research all products before buying. Ask an expert his advice, and allow the expert to buy and install your equipment. In the long run, you save your own time and money. ■





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CAP's Review Policy: Consumer-Friendly

I have an unusual vantage point on the computer industry. Perhaps some of what I see may aid you, the consumer, in selecting products to boost productivity of your computer system.

With companies constantly emerging with new products (seemingly on a daily basis), how can one hope to keep pace? There is the question of company stability when purchasing your hardware and/or software. Is the company you purchase a product from today going to be around to service it tomorrow? Or will product introductions tomorrow antique what you have purchased today?

Many questions arise during the product selection process. The selected item's features, installation, support,

performance, ease of use, error handling, documentation and compatibility with existing hardware are major concerns. CAP addresses these specific areas in our product review section. We work with over 300 product specialists across the country who review contributions. Our editorial staff first reviews all of the submitted evaluations to see if they merit review in CAP Magazine. And we feel the hands-on evaluation and rating card helps you, our reader, to efficiently and effectively critique products.

As publisher of CAP, it is my duty to monitor which products are being reviewed and subsequently research the financial stability and reputation of the manufacturer. In so doing, CAP is able

to provide our readers with information of the highest editorial integrity, and stated in plain English. You will notice that CAP only provides information on the top-rated products. Inasmuch as there are literally thousands of products available on the market today, the publishers of CAP have elected to select the better products in each category for print. It is our intent to inform our readers that when a product is mentioned in CAP, the evaluation is forthright and honest.

CAP's 800 Help Number

In the October issue, CAP will offer an 800 "Direct Response Express" telephone line for our readers. If you have an interest in a product you see in CAP, simply look at the 800 listings page in the back of the magazine and dial CAP's 800 number. You may inquire about as many products as you wish, and be sent literature within 48 hours. Our operator will play a 30- to 60-second tape on each product before returning to you to be of service.

You will also find that CAP's general response to your inquiries on the reader service card are processed more quickly than the majority of other publications.

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Apple Aid

Q I bought a Videx lowercase chip from a mail-order house for my Apple II+. The instructions were quite good and I had no problem installing the chip. When I turned on my system, I was surprised to see vertical bars about a character wide alternating across the screen. I replaced the original chip and the screen worked normally. The only nearby computer store has an Apple II+ computer and the Videx chip works correctly on it. Is my Apple too old to use the chip or could I have the wrong one?

A Unlike their fruity namesakes, Apples rarely become too old to use. Age, however, is often a factor in the matching of peripherals. The Videx technical support group suggests that your display of vertical lines could be an indicator of having an older board. Videx requires that you use an additional lowercase adaptor board if your Apple REV. (revision) number is VI or lower. Apple II and II+ users should become familiar with their motherboard revision number, which varies depending on the date of production. A description of the revision number may be found on page 89 of the Apple II reference manual. You may determine the revision level of your computer by looking at the motherboard for certain features. It is quite easy to determine REV. VI and earlier by looking for "memory-select" markings and jumper wires on the Apple motherboard at locations D1, E1, and F1. If the jumpers are present, your board is a REV. VI or earlier. We suggest you or your computer dealer determine the REV. level of your board prior to ordering the lowercase adaptor board. For more information concerning lowercase adaptors contact: Videx Inc., 897 N.W. Grant Ave., Corvallis, OR 97330, (503) 758-0521.

Q I have a Microsoft Z80 softcard that I have been using since 1980 on my Apple II+. I have never had any complaints

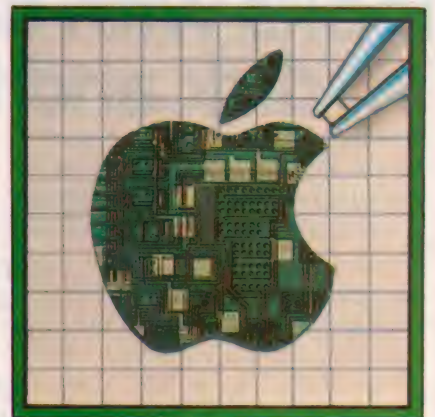
with it (except possibly for the limited disk space available to CP/M) until I tried to use it with my new IIe. The board won't work on the IIe at all. When I power up, the disk is activated but never reads past the first track. The softcard will boot up on the II+ correctly but Microsoft claims that it is compatible with the IIe also. I have carefully examined my CP/M 2.0 disks for errors and found none. What gives?

A From the information you have given me I think we may assume the softcard is functional and your disks are good. You failed to mention if your IIe was having any other problems so we will assume it does not. It always pays to be as systematic and complete as possible in eliminating the potential causes of the problem yourself before seeking outside assistance.

A phone call to Microsoft revealed a likely explanation to your problem. When Apple designed the IIe, some subtle system timing changes were made which would not interfere with most software and peripherals. However, the Microsoft softcard is a co-processor which actually takes over the control of the entire system, making precise system timing crucial. Because your softcard was produced before the IIe specifications were available, this timing discrepancy could be the problem.

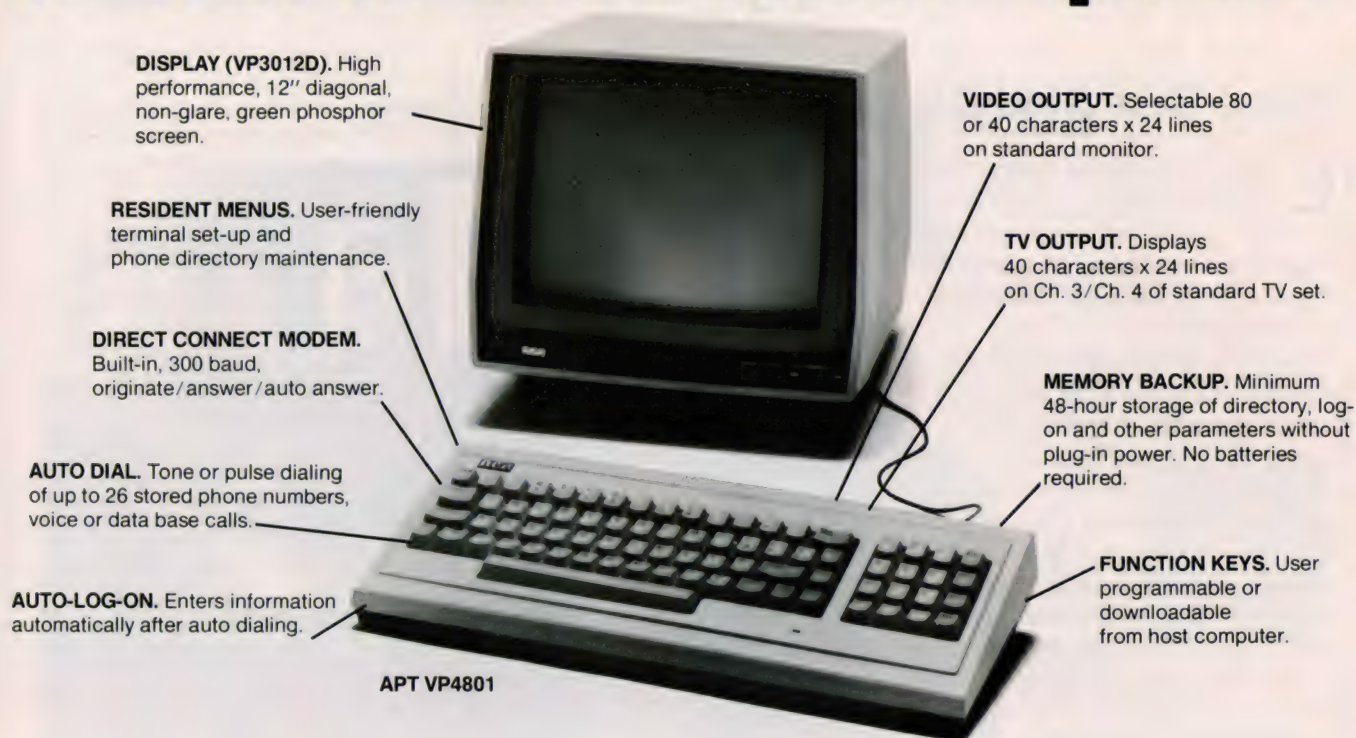
A solution that has worked for Microsoft is to replace one chip on the motherboard (main circuit board) with a more high-performance model. Be aware that this could void your warranty (if this is a concern call your dealer). The chip costs only a few dollars and is easily replaced if you are relatively nimble. If you are not technically inclined, virtually any computer store should be able to handle it. The chip in question is a 74S109. The replacement chip is called a 74F109 or 74ALF109 and should be available at any electronics store or a computer

store where an in-house repair service is available. To replace the chip, first turn off the IIe (I always also unplug it). Open the top of the computer, exposing the motherboard. Jot down the slot number of all of the boards and any switch positions which might get bumped. Carefully remove the 80-column board and any other boards that might interfere with access to the left edge of the motherboard. The chip to be removed is at location C1 (the third chip from the front of the computer on the left edge of the motherboard). Before swapping chips make certain that Apple hasn't already done so (on my IIe the chip was already a 74F109!). Using a small, flat screwdriver (or a chip-puller if one is available) carefully pry up and remove the chip. Find the small circular notch in the top of the replacement chip. With the notch facing the front of the computer, carefully insert the chip in the socket. Replace the boards that you removed and install the cover. Power up the computer and check for normal operations. If your problem was timing you may be back in business. Microsoft tech support may be reached at (206) 828-8089. ■



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RCA

Home Base Modular Workstations By Hartley G. Lesser

Computer furniture is more important than many of us realize. If fatigue is reduced, thanks to the design of a particular workstation, then the time spent using the computer is more productive.

However, factors other than ergonomics play a spoiler's role in the selection of computer furniture. For instance, one unit may be attractive but priced beyond budget. Or perhaps the workstation only offers a limited warranty, or the weight of your system and its peripherals exceeds the workstation's weight specifications. Fortunately, Home Base, Inc., of Ontario, Canada, has designed and manufactured a workable group of modules which, when placed together, provide for most users' needs at a reasonable cost. This equipment offers quality and value, and was selected as this month's Editors' Choice.

Features

This review covers four modules: the Basic Cube (for computer and monitor), the Cupboard (for printer and accessories), the Hutch (with shelf) and the Pull-Out Keyboard Tray. Each item must be assembled. Both the Basic Cube and the Cupboard have leveling feet to insure stability of the completed module. The hutch module consists of a shelf and back panel with a pre-cut hole for cable access. Both the Basic Cube and Cupboard have a pre-cut hole at the back-portion of the unit's top panel for power cable accessibility for system and/or monitor. The Pull-Out Keyboard fits beneath the top panel and pulls out into typing position when needed. All modules have a simulated wood grain finish.

Installation

The Basic Cube required less than five minutes to construct, and required only the included Allen key for tightening the 10 connector bolts and leveling



feet. The Hutch also required less than five minutes for assembly, although a small hammer was required in addition to the Allen key for securing 12 "cigar box" nails through the back panel onto the Hutch's frame. The Hutch rests upon two anchor pins inserted through the Basic Cube. The Cupboard required nearly 15 minutes to assemble due to the variety of hardware needed to construct the unit. The Cupboard features two hinged doors which include a lock for securing equipment and/or data disks beneath the top panel. The final construction was for the new, Pull-Out Keyboard Tray. This required 12 minutes to complete since it required the Basic Cube's top panel be removed for the insertion. Such wasted time

would have been negated had the reviewer opened all of the packages prior to initiating assembly of any particular unit. The Keyboard unit might require that two shallow pilot holes be drilled in the side gables of the Basic Cube. However, most Basic Cube units now come with these holes pre-drilled.

All modules are constructed of 44 lb. industrial grade, high density particle board. This material proved to be very sturdy. During construction of the Cupboard and an additional Hutch, a clumsy move toppled an adjoining Hutch and Basic Cube into a wall and rather stately, potted 7' ficus. Only the plant showed the ill treatment.

Continued on Page 91

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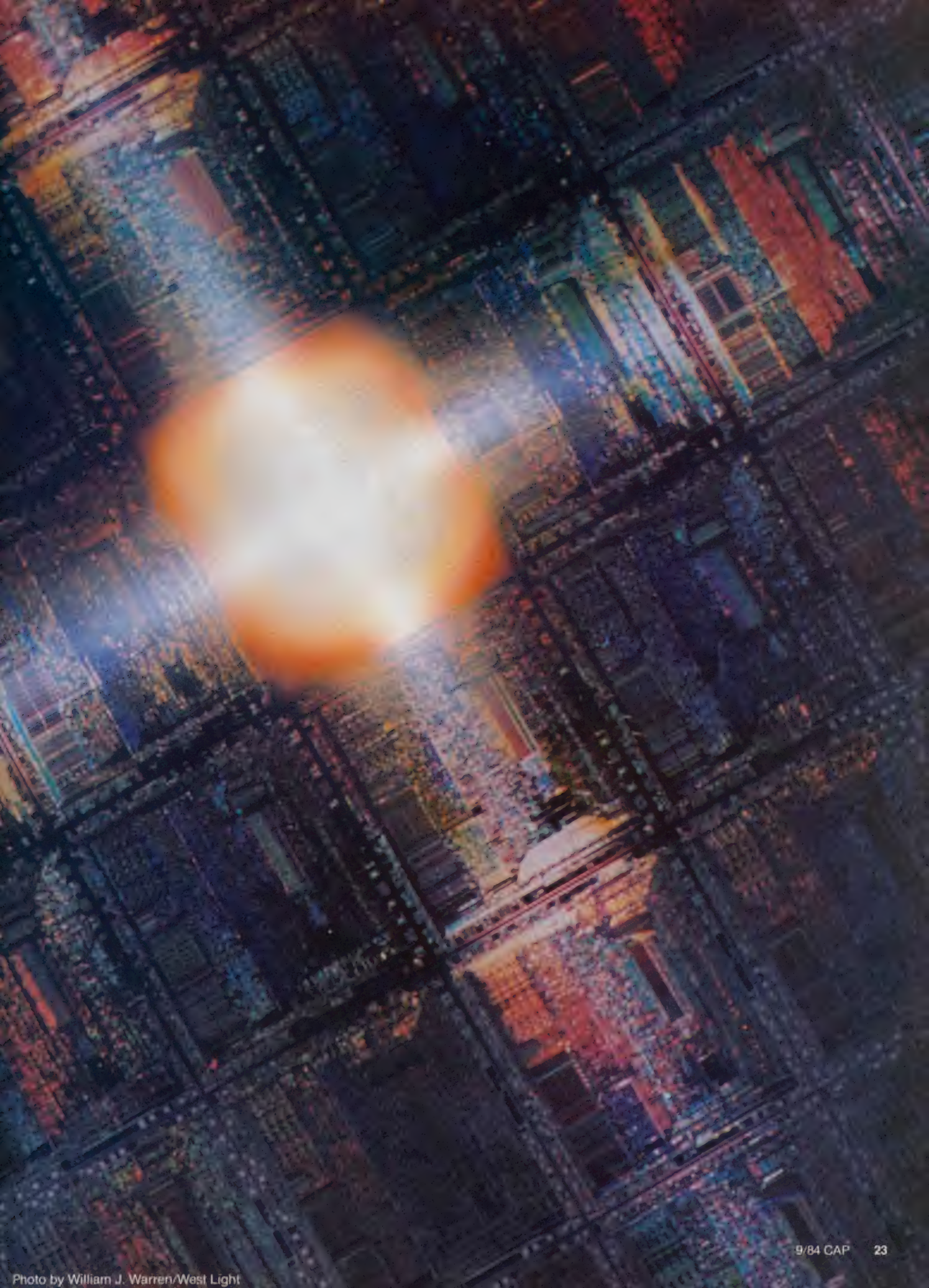
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EXPANSION BOARD PRIMER

MEMORY MAGIC

By Neil Lipson, P.E. and
Hartley G. Lesser

As a specie, humankind refuses to easily accept standards. Memory configurations for microcomputers have ranged from 4 K, in the early days, to 128 K. Such memory configurations are inadequate in many cases, depending on the system being utilized. For instance, several applications packages running on the IBM PC require 256 K as the minimal configuration, with another commercially available product requiring 512 K of Random Access Memory (RAM). This urge to go one better than what might be offered led to the creation of memory boards. Simply put, these plug-in boards add RAM to your computer. One of the first memory expander boards was for the Apple II+ computer and added 16 K to the system's basic 48 K of RAM. This opened the doorway to the use of Pascal as a viable language in an otherwise minimal environment.



MEMORY MAGIC

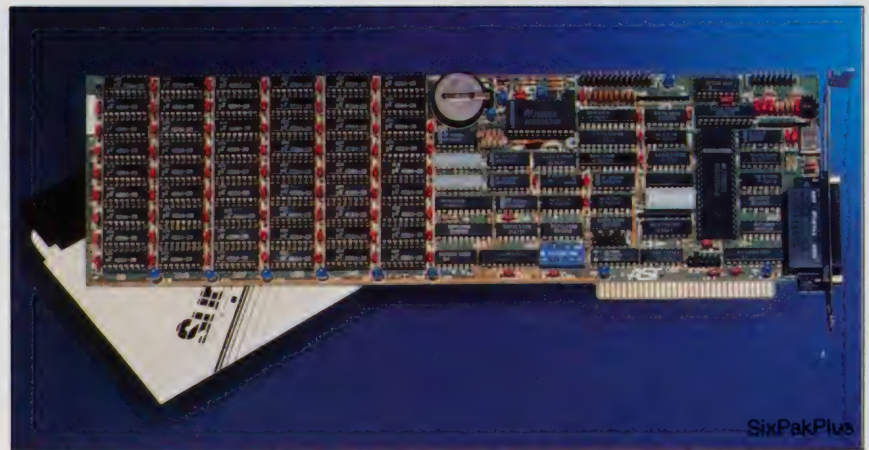
All of the IBM and the Apple computers, as well as their compatibles, allow for the use of such memory expansion boards. Configurations for these boards run the gamut from 16 K through one MB. A pure RAM board is not as easy to find, as most marketed boards are now multifunction. This means that several other features are offered on the same board along with the additional RAM. A serial and/or parallel port, a clock/calendar, game Input/ Output (I/O) port, and battery backup are common features.

But what good is additional memory? Well, RAM additions to memory provide your computer with printer buffering, disk emulation, pure expanded memory and numerous other features. All are time-saving features, primarily responsible for allowing your computer to get to work in a more effective manner.

Emulation Envy

The most common use for these cards is as their name designates — memory expansion. This is an important asset for those who are programmers or for those who use spreadsheets. And who of us hasn't dabbled with a spreadsheet at one time or another and decried the lack of memory available during a critical calculation. Suddenly, there's not enough RAM available to complete the projection. This required saving what had been done to disk and returning to your point of aggravation or else losing the entire work effort. Now, with this extra memory installed, the Calc doesn't beep at you after 64 K of RAM has been used. You have plenty of memory room left to complete your calculations.

You may also take advantage of what is termed "disk emulation," "pseudo-disk" or "RAM disk" capabilities. This is simply using your increased memory as a fictitious disk drive, actually playing a trick on your computer. Your system is fooled into believing the extra memory is the area where information normally stored on a physical disk drive is saved or called from. This saves time in the reading and/or writing of data from a disk



drive. You don't have to wait for the drive's read/write head to access the sector and tracks where the data is stored, retrieve this data and place it into RAM to be acted upon by the loaded software program. If you have enough added memory, you can also store both the program and the data in your pseudo-disk. The annoyance of waiting for sorts or lists to be read from disk, acted upon in limited RAM and then rewritten to the storage media need no longer afflict you. This data, now stored in RAM, is instantly accessible and modifiable.

All of the spreadsheets for the IBM and its compatible machines automatically implement the use of installed memory cards. There are no special pre-boots or custom programming required to access this extra memory. Once the dip switches are set in both the computer and on the expansion board, their installation is complete. Many IBM configured spreadsheets, such as Lotus 1-2-3, won't run with less than 192 K of available memory. As the standard IBM memory configuration is 64 K, should you wish to use

Continued on Page 28

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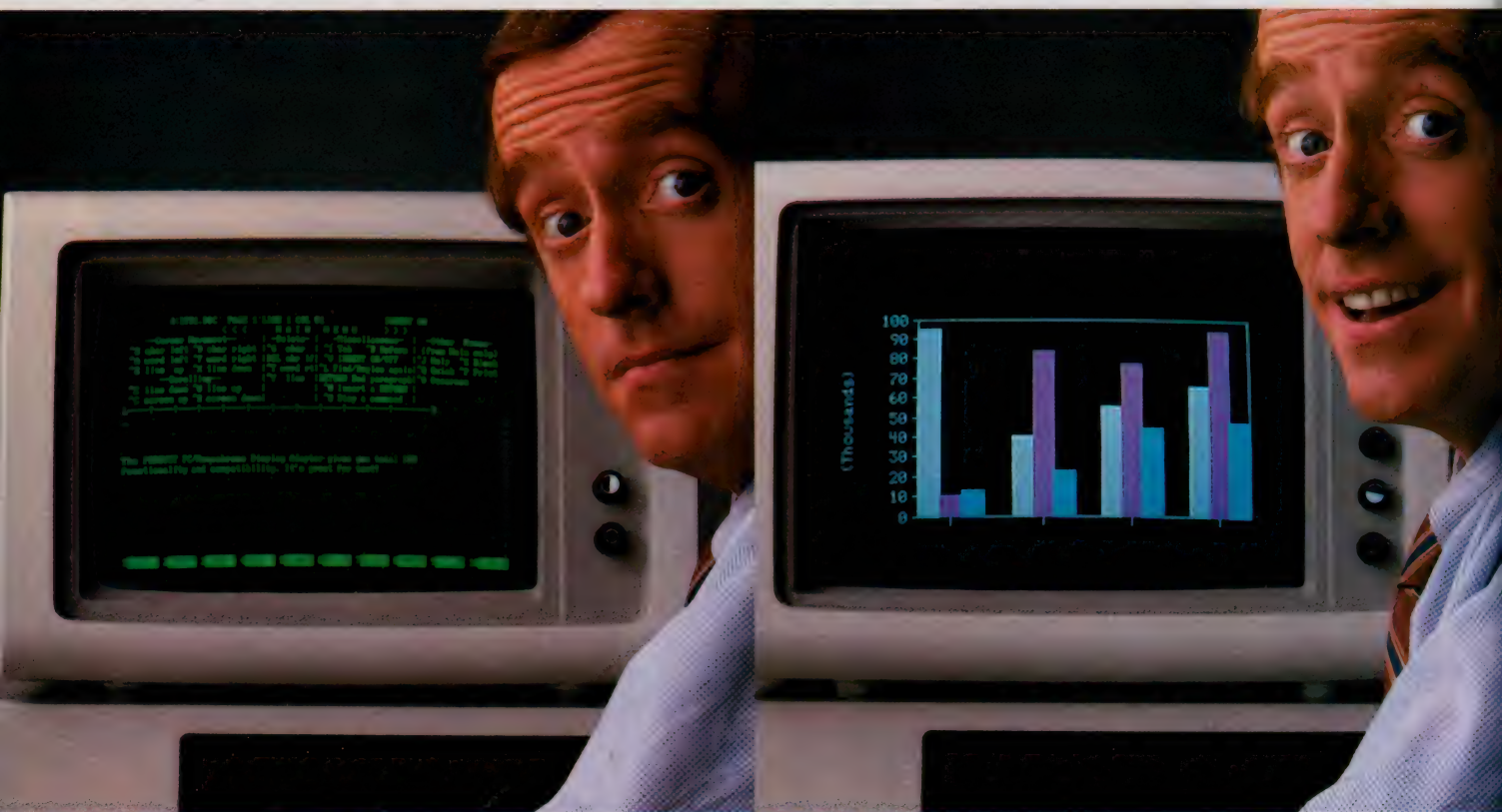
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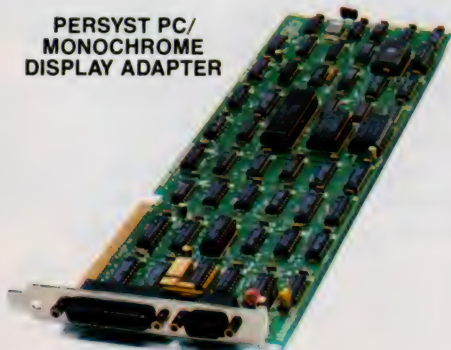
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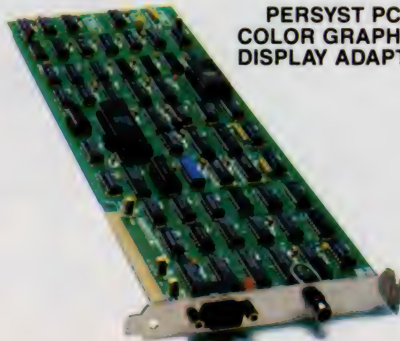
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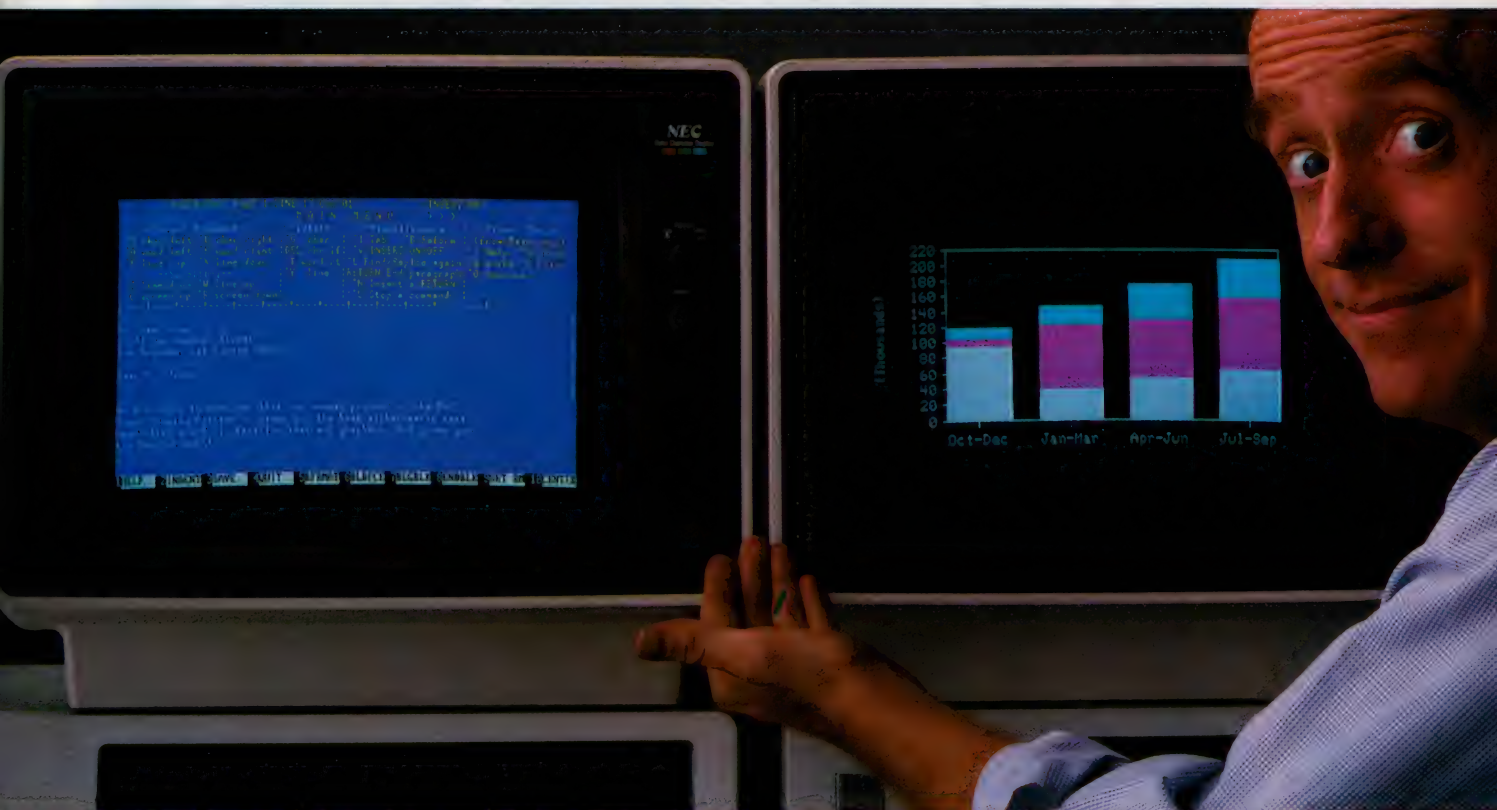
And optional 640 x 400 resolution is available for custom applications.

Custom programmable character sets. BoB gives you flexibility for special applications.

Revolutionary text resolution is just the start of BoB's unprecedented capability.

It is also the only display adapter that lets you use up to three character sets. Two in ROM, and one

DISPLAY ADAPTERS—MONOCHROME, DISPLAY ADAPTER—FROM ONE COMPANY?"



"The best resolution ever—plus color graphics and programmable character sets—all on one board?"

downloadable into static RAM.

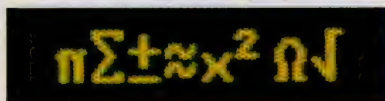
Think of it.

With this unique option, you can design and download up to 256 custom characters. In any combination of language, scientific notation or graphics sets you want.

And you can change character sets as you change applications.

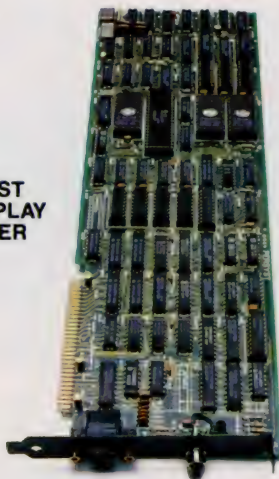
That's powerful flexibility you can only get with BoB.

And only BoB lets you software select between three ROM/RAM character sets. So there's no more struggling with hardware when you want to switch.



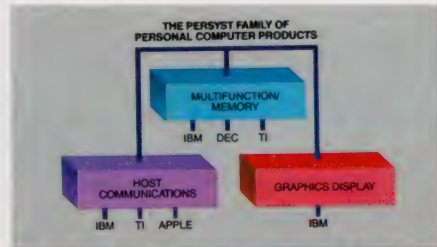
Foreign languages. APL programming language. Scientific notation. With BoB, you can utilize any combination of character sets.

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"YOU CAN WITH PERSYST."

Circle No. 138

MEMORY MAGIC

Continued from Page 24

such a popular program, you have no choice but to expand the computer's RAM to the required memory size by installing a memory expansion board. Most IBM programs require 128 K of RAM for operation in this environment. What should now be considered the proper configuration for a business environment is nothing less than 128 K of on-board RAM and 192 K in disk emulation.

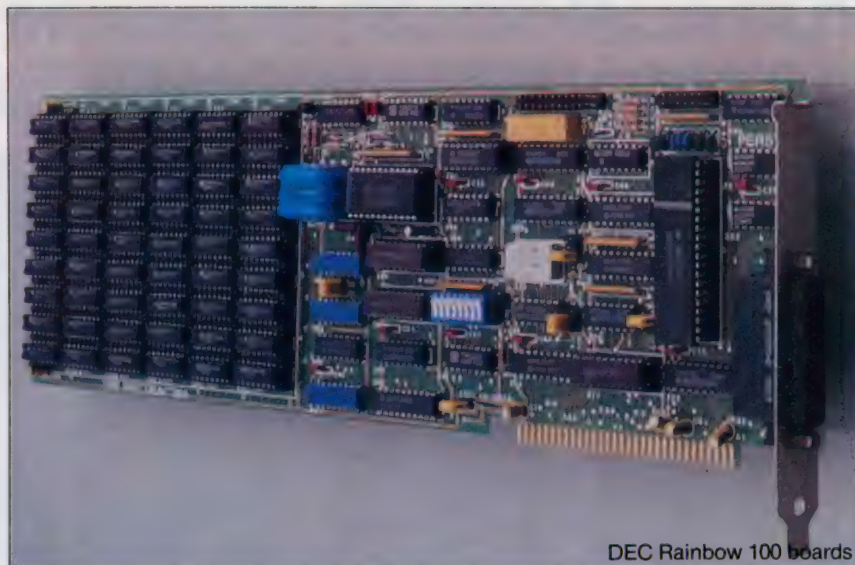
In the Apple environment, pseudo-disk implementation is possible only if the loaded application software has been written to include such a feature. Programs such as MagiCalc, IACalc and AceCalc, to name but three, automatically access any extra memory. By combining additional special function cards with a memory expansion board, the upper limit for use becomes nothing short of inspiring. For example, should you have a standard 64 K computer and add in a 128 K expansion card plus a 64 K Z80 (CP/M) card, you're now looking at about 220 K in your Apple suitable for spreadsheet operation!

Scintillating Speed

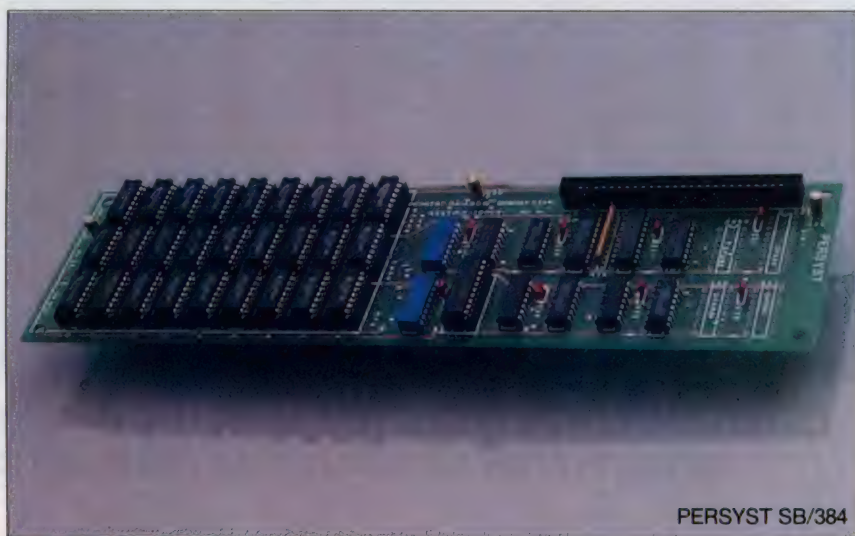
Disk emulation provides for phenomenal speed in accessing data. For example, using a 128 K RAM board in an Apple computer produced an information load ten times faster than a load via a normal disk drive. Apple DOS 3.3 is not known for its speed. If you were to use a faster DOS, an additional increase in speed by a factor of 5 could be realized. This offers a total speed improvement of 50 times over a normal disk drive. Add other special boards, such as one of the accelerator cards, and speed increases to a factor of 120 times or better. The IBM's performance is also positively affected through use of disk emulation. A file copy that would normally take 30 seconds to load without emulation takes approximately one second to load when a memory card is initialized as a drive emulator.

Buffer Bonus

On occasion, the military adage of "Hurry up and wait" seems most appropriately applied to computing. How



DEC Rainbow 100 boards



PERSYST SB/384

often have you had to sit and wait while your printer and computer were involved in the creation and production of correspondence? This need no longer occur with most memory expansion cards.

CONTROL OF YOUR COMPUTER IS NOT PIRATED BY THE PRINTER.

Your board's RAM is partitioned or, in some cases, totally assigned to the task of storing data for feeding to your printer. This allows you to continue with other computer work while the data is sent to your printer through the spooling process. Control of your com-

puter is not pirated by the printer. You may proceed with whatever work you happen to be involved in as your printer merrily prints the designated information stored in your memory board. Naturally, the amount of information that can be so buffered is dependent upon the total amount of RAM purchased with your board. Print buffering, or spooling, therefore enables you to dump a text or other file to your printer and have control of the computer returned to you almost immediately.

A Word to the Wise

No matter how viable a product may seem, there's always someone on the periphery warning about non-standard equipment or exceptions to the rules. For the most part, most of the memory expansion boards are well documented and simple to install, no matter what computer one is using.

Continued on Page 30

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But all the software you may ever need is already included in the T/Maker III software package. T/Maker III is a completely integrated program which includes: word processing, spreadsheet modeling, bar chart graphing, file management, list and record processing—easily handled with one program, instantly interchangeable.

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Circle No. 139



However, two extremely important considerations should be noted. First, whatever data is stored in a memory card is volatile in nature. Should you turn off the power to your computer BEFORE saving your modified data to

your storage media, you've lost the ball game. Second, RAM cards add heat to the interior of your computer. Consider a fan to cool your system. This is by no means as critical as turning off your computer before saving your data, but you should do all in your power to ensure the successful operation of your peripherals.

Memory cards aren't a peripheral you should sit and think about using... you should already be out the door to purchase one. **CAP**

Neil Lipson is the owner of Lipson & Associates in Broomall, PA.

Hartley G. Lesser is the editor of Computer Accessories and Peripherals Magazine.

Buyer's Guide

The following companies manufacture and market memory expansion boards. Several of these boards are multifunction in that they offer features in addition to memory expansion. An upcoming article in CAP will reveal all there is to know about multifunction boards.

Tecmar, Inc.
6225 Cochran Rd.
Solon (Cleveland), Ohio 44139-3377
Captain and 1st Mate (IBM PC)

Advanced Logic Systems
2685 Marine Way, Ste. 1209
Mountain View, CA 94043
Add-Ram (Apple)

Microlog, Inc.
222 Route 59
Suffern, NY 10901
Baby Blue II and Little Red RAM PLUS (IBM)

Orange Micro, Inc.
1400 N. Lakeview Ave.
Anaheim, CA 92807
Mr. Chips (IBM)
Buffered Grappler + (Apple)

Persyst Products, Personal Systems
17862 Fitch
Irvine, CA 92714
Time Spectrum (IBM)

AST Research, Inc.
2121 Alton Ave.
Irvine, CA 92714
SixPackPlus and ComboPlus (IBM)

ABM Computer Systems
3 Whatney
Irvine, CA 92714
Superboard (IBM)

Titan Technologies, Inc.
Box 8050
Ann Arbor, MI 48107
Neptune (IBM)

Synetix, Inc.
10635 N.E. 38th Pl.
Kirkland, WA 98033
Flashcard (Apple)

Abacus Enterprises
Box 1836
Detroit, MI 48231
Know-Drive (Apple)

Alpha Logic Business Systems
4119 North Union Rd.
Woodstock, IL 60098
Saturn (Apple)

Quadram Corp.
4355 International Blvd.
Norcross, GA 30093
Quadboard (IBM)

Applied Engineering
Box 470301
Dallas, TX 75247
Memory Master IIe (Apple)

Micro Co-op
610 East Brook Dr.
Arlington Heights, IL 60005
16 K RAM card (Apple)

Omega Microware
222 South Riverside Plaza, Ste. 2234
Chicago, IL 60606
Ramex 16 K and Ramex 128 K (Apple)

Frontier Technologies Corp.
Box 11238
Milwaukee, WI 53211
RAM card (IBM)

Orbital Systems
2929 East Jasmine
Mesa, AZ 85203
DiscoRAM (Apple)

Personal Computer Products
16776 Bernardo Center Drive
San Diego, CA 92128
64 K and 128 K extenders for AppliCard (Apple)

Titan Technologies
Box 8050
Ann Arbor, MI 48107
Saturn and Titan (Apple)

Wesper Microsystems
14321 Myford Rd.
Tustin, CA 92680
Wizard PC Memory Card (IBM)

Seattle Computer
114 Industry Drive
Seattle, WA 98188
RAM+6 (IBM)

Profit Systems, Inc.
30150 Telegraph Rd.
Birmingham, MI 48010
ADDRAM Elite and ADDRAM Plus (IBM)

Tseng Laboratories, Inc.
Box 566
Newton, PA 18940
UltraPAK (IBM)

Apparat, Inc.
4401 S. Tamarac Parkway
Denver, CO 80237
RAM card (IBM)

Chrislin Industries, Inc.
31352 Via Colinas #101
Westlake Village, CA 91326
CI-PCM & CI-PCM+ (IBM)

Raytronics
4901 Morena Blvd., Bldg 900
San Diego, CA 92117
Fleximem & RamPlus (IBM)

MNC International, Inc.
511 11th Ave. #429
Minneapolis, MN 55415
High Density Memory Board (IBM)

Vista Computer
1317 E. Edinger Ave.
Santa Ana, CA 92705
Maxicard (IBM)

Maynard Electronics
400 Semoran Blvd.
Casselberry, FL 32707
RAM card (IBM)

Memory Technologies
4343 Gran Prix Dr.
Logansport, IN 46947
Versa-RAM (IBM)

\$2,490

Great Lakes offers you add-on storage and tape back-up at an unforgettably attractive price

So you're about to outgrow the storage capacity of your IBM PC™ or compatible computer? And now you're biting your nails over the cost of adding more bytes.

No need! Consider the eminently memorable combination price of the Great Lakes Superior 10™ hard disk subsystem and the Great Lakes Quartermaster 23™ tape back-up module.

The Superior 10—\$1495

Not only is our \$1495 price considerably lower than the nearest 10-megabyte competitor, but we offer the best dollar-per-megabyte ratio for the 23mb and 40mb subsystems as well. The ratios? 10mb at \$149 per mb; 23mb at \$98 per mb (retail \$2249); 40mb at \$70 per mb (retail \$2795).

Quartermaster 23—\$995

This optional 23mb tape back-up module is simple to use and efficient as well. Take, for example, our remarkable Selecta-File™ feature. This 1/4-inch tape drive module allows you to back up and restore data using selective file-by-file data transfer (or full streaming). And it masters all this for just \$43 per megabyte.

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When you buy a Superior hard disk subsystem, everything is there, ready to operate at high speed. This includes: high quality fixed hard disk, controller board, software that runs on DOS 1.1 and 2.0 (CP/M 86™ and other operating systems available), host adaptor board, integral power supply, cables, external custom chassis with additional space for our tape back-up, and documentation.

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Part IV

BUSINESS PRESENTATIONS

SHOWING YOUR BEST SLIDE

By Elliot King

During a recent Consumer Electronics Show, an editor of a computer trade journal hunched over a small table in his room at the Imperial Palace Hotel in Las Vegas. Before him lay stacks of papers filled with numbers: the number of pages in each magazine, the number of ads per issue and the number of sales leads each ad had generated. Concerned with long-term viability, the editor wanted to show a correlation between the total number of pages per issue vs. the number of sales leads per advertisement. He felt if he showed that connection, he could win a financial commitment from his company's corporate staff to guarantee a certain number of pages per month.

His problem? Deadlines had kept him from completing his analysis in the office. Now, at the show, he hoped to finish on time to make photocopies to distribute at a sales meeting in a matter of hours. And he doubted he would have a complete product ready by that time. For the third time he had forgotten to connect one of the dots in the graph, skewing his results. "Too bad," he said. "It is just going to have a correction on it."

But the corrected version looked shabby. His presentation showed neither the professionalism nor the enthusiasm he had hoped to convey. With more time and the right materials, his presentation would have been far more effective.

Computer-Generated Graphics

The line charts this manager struggled to prepare can easily be handled by personal computers armed with the correct software and peripheral devices. Indeed, graphics output devices — monitors, dot matrix printers, ink-jet and laser printers, pc slidemakers and others — have recently dipped sharply in price. Multicolored pen plotters now sell in the \$1,000 range and Apple Computer Corp. markets a color printer based on thermal technology at a price affordable to most home computer users.





PRESENTATIONS

"In the past, graphics were a fairly tedious thing to do," said David Golden, an official at Strobe, a Northern California-based manufacturer of plotters. "But once middle management realized what could be done with available equipment, they went nuts," he said.

But the array of marketplace choices presents prospective purchasers with difficult decisions. The criteria for assembling a good graphics system is not the same as that used for a system or software purchase. For most computer-related purchases criteria such as ease of use, reliability and price are important. With graphics devices, it's determining what is to be presented and to whom, and then finding the right tools.

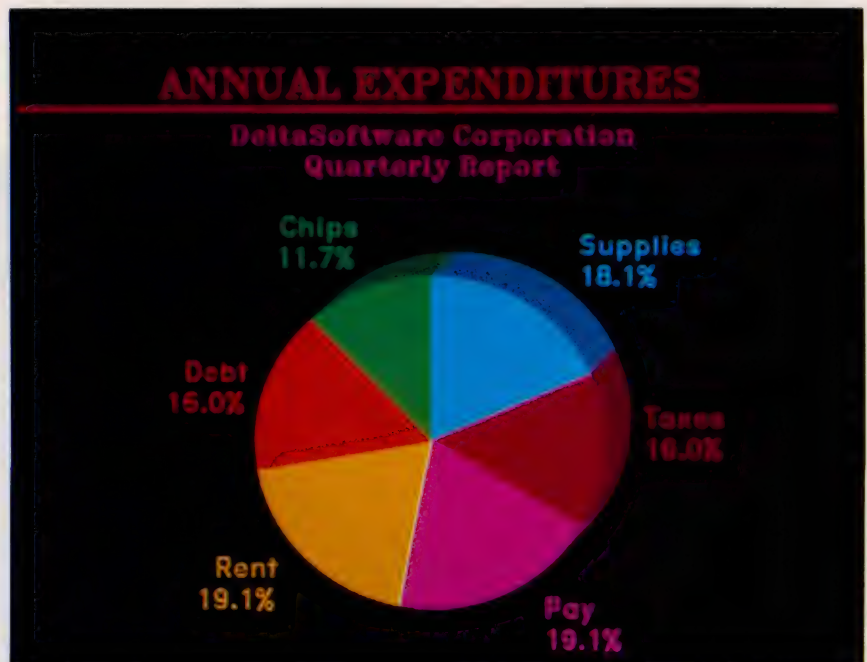
"The first step," said Jose Ramos, marketing manager for Corporate Data Science, which has introduced a high-resolution text and graphics processing system, "is to identify a need and find the equipment to fill it."

And finding the right solution isn't an easy task. Said Strobe's Golden, "The real thrust for using graphics is that it organizes massive amounts of data." In addition to graphs, business graphics routinely include organizational and flow charts, engineering and other drawings.

But packaging data is only part of the mission. The prime goal is communicating information to an audience in the most understandable fashion. And it is the audience that defines how the graphics will be used. Consequently, in exploring graphics devices and developing presentations, users should not have their own needs in mind but their audience's.

For example, the New York Academy of Sciences annually convenes where its professors speak before an audience of laypeople on scientific topics of social import on themes such as "The Impact of Computers on Culture."

At this conference, a sizeable chunk of time was devoted to presentations with computer-generated graphics. Scientists, more comfortable in lab coats than tweeds, discussed new horizons of the images computers could create. Their samples, created on main-



Produced by Lang System's (Menlo Park, CA) VideoSlide35 computer graphics camera.

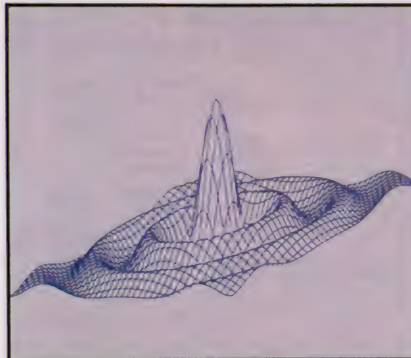


Photo courtesy of Panasonic

frames, made real objects seem like lifeless imitations of art.

And as they presented their research, many used overhead transparencies with magic marker lines.

Why? One scientist speculated, "Scientists are used to lecturing people with the help of a blackboard. They want to be able to mark it up and erase it as they like, as the whim strikes them during their talk. That is the way they like to do it." But with easy to use, sophisticated graphics packages available, it seems a contradiction in terms.

Types of Packages

Many business graphics packages have been designed for an audience of one, the user. Creators of this type of software foresee it winning a niche in the office by aiding middle managers in data analysis.

Naturally, if analysis assumes primary importance, the monitor assumes

the role of leading output device. Devoting time to finding a sharp resolution color monitor becomes cost effective.

But these "graphics for one" can be shared. Dr. George Hess teaches business administration at Loyola Marymount College in Los Angeles, CA. He also operates a small market research firm. To present data to a client, he uses his Apple IIe to illustrate trade-off analysis, pitting certain attributes of a product against others until a balance is reached.

"The technology is new enough that people are rather impressed," Hess said. He acknowledges he could easily use a dot matrix printer to attain suitable quality output but, for his clients, he feels using the computer screen enhances the overall impact of his presentation.

Others have used graphics intended for one purpose creatively for another. For example, shortly after Apple shipped the Macintosh, some computer store ads began to look rather homebrewed. Those reading the ad, replete with pictures and fancy fonts, soon discovered the reason. The retailers had created the ad on the Macintosh to demonstrate its graphics dimension.

Many software packages, however, help you reach others effectively. Richard Ayers, a West Coast space sales rep, needed to prepare a report breaking down the distribution channels,

Continued on Page 36



BDT's low cost LetterMate I/c, like all BDT sheet feeders, fits on virtually every letter quality printer.

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PRESENTATIONS

product categories and price points in the market in which he worked. He wanted to evaluate the overlap according to the consumer perception of each product.

Using a framework found in the *Wall Street Journal*, he drew a large cross. Each pole was labeled with contrasting attributes. Products, channels carrying those products and price points were plotted in appropriate places in the four quadrants. Proud of his handiwork, Ayers sent the material to his supervisor, who didn't understand what he had done at all.

Ayers' problem? "I had conceived of the thing as an overhead transparency. I had to be there with the explanation, to illustrate what I was doing as I did it," he said.

Where to Use Them

Most graphics are used in written reports. In those cases, dot matrix, ink-jet or laser printers could suffice. But dot matrix printers and ink-jet printers do not work well on the mylar needed for overhead projection. And when standing before large groups, many speakers prefer slides. The creative method you choose depends on your audience and what you're comfortable working with.

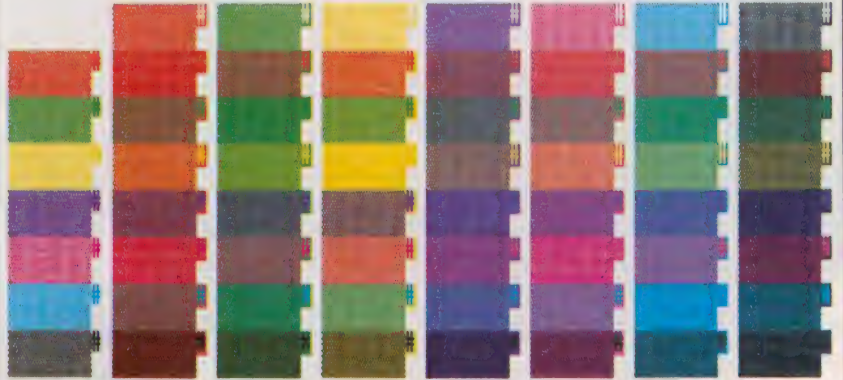
As might be expected in as wide-ranging a market as graphics, the quality delivered by a graphics device demands careful attention. For example, a vice president of a small manufacturing firm wanted a pie chart to show revenue by product. His point — the company had become overly dependent on a single category. Using an Epson QX-10, Valdoks software and a dot matrix printer, he quickly churned out an odd-shaped picture that looked more like an egg than a pie. Still, he distributed it with a humorous memo saying the shape of the chart reinforced the odd composition of their recent sales. "I wouldn't have used it in a presentation to venture capitalists," he said, "but it got my point across."

As more businesses become aware of the potential of graphics, the demand for quality has risen. "Users of inexpensive microcomputers have always

wanted to print out what they've done on the screen, but a black-and-white reproduction of a multicolored display is really disappointing," said Steven B. Weissman, an analyst with International Resource Development, Inc. Consequently, his firm predicts that the color printing market will grow from \$750 million in 1984 to \$4.1 billion in 1993. IRD expects ink-jet printers to capture

Adds Cross, "Film is making inroads because there are solid modeling and other three-dimensional things that don't look nice when done by plotters and ink-jet printers."

When you really know what you want in presentation or analytic graphics, shopping becomes feasible and choices obvious. "It becomes a reiterative process," said Ramos of Corporate



Quadjet sample color palette by Quadram is small and portable so you can put it just where you want it. Quadjet uses disposable ink cartridges that are a snap to change. Just pop the old one out and the new one in. You'll find that each prints about 4 million characters.

THE CREATIVE METHOD YOU CHOOSE DEPENDS ON YOUR AUDIENCE . . .

the lion's share of the growth, with plotters also showing healthy gains.

If buying criteria can be thought of as a table, the frequency of graphics presentations represents its fourth leg. For example, according to William Cross, a vice president at VideoSlide 35, a maker of machines that generate 35 mm slides directly from personal computers, to have a slide sent out to be made can cost up to \$75. For one short presentation a year, even this high price may be cost effective. But if a company does numerous presentations, a slidemaking device would be more advisable.

Data Science. "You look for the best software and the most reliable machine at the best price. You want software that will let you grow, hardware that can be easily serviced and a package including peripherals that fits your budget. You keep weighing one factor against the other until you find what you want."

Building a graphics system and preparing graphics displays require more effort than some other aspects of personal computing. In addition to the software and computer, specialized input and output devices may be required. Each element must interface correctly with the other. The choices available can fill the most exacting needs. But you must know your needs: Who your audience is, how often you must make presentations and to whom, the quality expected and your budget. Keeping the criteria in mind makes planning and executing successful presentations a snap.

Elliot King is West Coast editor for Gordon Publications High Technology magazine group.

What's the best recommendation you can make when you're asked about business graphics?



The New Business Professional Plotter from Hewlett-Packard—The 6-Pen HP 7475A

Today, business professionals are becoming more aware of the vital importance of business graphics to their success. Tomorrow, they may be asking for your recommendation. Here's some important information that will help you. Tell them...

Make a first impression that lasts

Truly impressive graphic presentations can create a first impression of quality and professionalism that lasts and lasts. The way you present your information can be equally as important as the information you're presenting. And that's where the new HP 7475A Business Professional Plotter lets your professionalism shine through.

Standards unsurpassed in the plotter business

The technical standards of the HP 7475A have no equal for producing quality graphics. With a resolution of one-thousandth-of-an-inch, curved lines are smooth, not jagged, and straight lines are *consistently* straight. Its exceptional repeatability (the ability of a pen to return *precisely* to a given point), assures that intersecting lines and circular shapes will meet *exactly*.

Compatible with almost any personal computer in your office and supported on today's most popular graphics software packages

The HP 7475A quickly "makes friends" with most of the personal computers you may already have in your office, including IBM®, Apple™, Compaq™, Osborne®, and Commodore™—as well as a host of HP computers. You even have a choice of many off-the-shelf software packages that give you "first-day" productivity with the HP 7475A.

Your Choice: 2 media sizes

While most professional business applications will be satisfied with standard 8½ x 11" paper or transparencies, the HP 7475A adds the capability of plotting on larger 11 x 17" media, too.

The cost? Surprisingly affordable

The new HP 7475A Business Professional Plotter is an amazingly affordable \$1895. When you consider the high cost of having your graphics prepared by an outside service, you'll find the return on your investment is almost immediate.



Another choice: HP's low-cost, high performance Personal Computer Plotter

For the "business on a budget," you may also want a look at our 2-pen Personal Computer Plotter, the HP 7470A. Its low-cost (only \$1095) is as remarkable as the quality of its plots. With many of the same features as the new HP 7475A, the HP 7470A plots on media up to 8½ x 11" It stores and caps two-pens, and you can easily change the pens for multi-color plotting.

Send for your FREE "Better Presentations Package" today!

For a FREE sample plot, overhead transparency, and more details, mail the coupon below. We'll also enclose a list of software packages you can use right "off-the-shelf."

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11304 CF9
YES! I want to make the most informed business graphics recommendation I can. Please send me your FREE "Better Presentation Package," so I can learn more about the new HP 7475A Business Professional Plotter and the HP 7470A Personal Computer Plotter. I understand I will receive this valuable package without cost or obligation.

Name _____ Title _____

Company _____

Address _____

City, State & Zip _____

Phone Number () _____

My computer is _____

Send to: Hewlett-Packard, 16399 W. Bernardo Drive,
San Diego, CA 92127
Attn: Marketing Communications

Circle No. 127

CASE STUDY FOR BUSINESS PRESENTATIONS

Effective Slides From Your IBM By Laura Lang

Has the president of your company ever frantically called at 8 a.m. and asked you to prepare (from scratch) a presentation on the company's current income and spending figures for the past three years, broken down quarterly, and highlighting a certain department? Oh, by the way, by 10 a.m. when the board of directors will be swinging by?

Did you grab for a ruler and graph paper? Colored pens? A stiff drink?

Studies have shown that slides reduce meeting times by 28% and make a more impactful overall impression. And for diverse audiences, such as students and executives, these presentations have to be tailored "on the spot." Meaning reshoots, high cost (overnight) developing and mounting fees, and making more than enough "just in case."

Answers have been slow in appearing. Screen shooters seem to lack the quality of "real" slides. These hooded cameras shoot visuals right off your CRT screen and have the inherent problems of adjusting to screen size and distortion, dirty screens and clarity.

A second generation to the screen shooter has been introduced by Digital Research (Pacific Grove, CA) in a combined effort with Polaroid Corp. Called Presentation Master, this unit and its accessories works with your IBM PC or XT to make vivid, full-color slides of computer-generated graphics. The package allows you to be creative, imaginative and spontaneous.

For a suggested retail price of \$1,995, it comes with the Image Recorder 35 mm instant print camera, 35 mm slide autoprocessor, slide mounter and two graphics programs — *DR Draw* and *DR Graph*. What it lets you do is create slides directly from the program. You can create your own images, such as maps, or use "standard" ones like pie charts, bar graphs or organizational charts. You can pick size, color and



Produced by Digital Research Inc.'s (Pacific Grove, CA) Presentation Master.

other variables. In essence, within 20 minutes you can have an up-to-the-minute presentation ready for that stockholder or student who has just dropped by.

The Los Angeles division of Atlantic Richfield Corp. is currently testing the Presentation Master with upper and middle management — the primary target audience for the product. Although they are not a Research and Development department, they do like to have a copy of state-of-the-art offerings for personal computer users.

Initially, they were impressed with the timeliness and control the product gave them and felt that it was economically priced. One manager who had given a presentation with Presentation Master-prepared slides said he felt his slides lacked professional quality mainly because of his lack of experience. He had prepared red-on-black graphs which he felt lacked the impact he needed. Upon further experimentation, he found yellow on black a much better contrast for the graph — a combination artists and those accustomed to working with colors would have been aware of immediately; however, this color combination is not commonly known knowledge for the middle to upper manager.

They found that it took about two days for users to become familiar

enough with the package to get really successful results. This was because of experimentation with different sizes and colors. "If you're determined to use it, you'll get great results. If not, you might be disappointed," one employee said. They felt it might be advantageous if Digital included some color hints in their documentation, and shortened their manual.

Atlantic Richfield's middle management is using the package and enjoying it, but upper management shies away from the do-it-yourself process, preferring to assign the projects to other employees. Yet it is relatively easy to operate, and saves time and money.

The idea and the product are good, and it's certainly a step in the right direction. I found the product easy to use and the results very good. Of course, I used a "tutor program" that will sell with the marketed product.

Creating your own slides is exciting, but like all present computer offerings, you have to be willing to initially invest time and energy. I found this the most effective presentation producer available now, and for companies contracting out slides for presentations, it is certainly a worthwhile investment. It produces slides at a low cost, on the spot. You can truly tailor your presentation to your audience. **CAP**



INTRODUCING THE MOST EXCITING PART OF OWNING AN ATARI®

THE CONCORDE C-221 DISK DRIVE SYSTEMS

AT LAST, A TOTALLY NEW CONCEPT FOR ATARI DRIVES

Concorde introduces an exciting new concept in Atari compatible disk drive systems. A concept combining high quality and reliability, enhanced data storage accuracy, and a unique master/slave concept that provides an excellent value for the money.

Concorde's C-221M Master is a self contained disk drive unit, complete with a high quality disk drive, power supply, and disk operating system software. In addition to providing high accuracy and rapid retrieval of data storage, the C-221M can also support up to three Concorde C-221S Slave drives.

Concorde's C-221S Slave drives provide the same high accuracy, high quality, rapid retrieval data storage but at a reduced cost. This is achieved through reduction of duplicated parts between the master drive and its slaves.

The result? A fully Atari compatible disk drive system, giving you the versatility you need to use the most sophisticated programs for word processing, spreadsheets, databases, and even personal finance, with very economical upgrade capability.

EXCEPTIONAL DESIGN

The Concorde C-221 models were specifically designed to visually complement your Atari system. Sleek metal cases provide durability and rigidity not available with plastic. Large, easy to use controls have been simplified for ease of operation. Simple indicator lights provide essential data that you can use, not just extraneous information. And, in addition to being easy to use and looking great, we designed the C-221 series to take up less space than competitive models, meaning you'll have more valuable workspace available around your Atari system.

WE DIDN'T FORGET THE DETAILS

Every Concorde disk drive system is built with exacting attention to detail. The C-221 series is no exception. From initial design, through the manufacturing and testing processes, Concorde drives are expected to meet the most critical evaluation standards. That's why we use components like direct drive motors for better speed control than typical belt drives. Optical track zero sensors rather than mechanical stops for greater accuracy and longer head alignment life. Die cast



metal heads with glass bonded surfaces for greater reliability, and, every drive has its electronics fully burned-in for 48 hours to insure peak performance. All this, and more adds up to a drive that can provide up to ten times the reliability of some competitive drives. And that's not just a claim, we guarantee it.

THE BEST NEWS OF ALL

Anybody can make incredible advertising claims, but it's when you get the drive home and start using it that you really find out how good it is, and how much the claims are worth. At Concorde, we don't think you should put up with wild promises and lots of headaches.

We guarantee our drives. We guarantee compatibility. Our C-221 series uses a licensed Atari DOS for maximum software compatibility. The disk operating system is included with every C-221M unit, in both the single and double density versions, at no extra cost.

We guarantee trouble free operation, not for 90 or 120 days like some manufacturers, but for one full year. And, in the unlikely event your Concorde drive should develop a problem, we don't ask you to go through the runaround of trying to get it repaired. Simply return it to your authorized Concorde dealer. Show him your receipt, and he'll simply exchange your drive - over the counter - with no hassles - at no charge.

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After reading about the great new C-221 series Atari compatible drives from Concorde, you probably expect them to be high priced. But even with all these great features, and even with the great warranty, Concorde's C-221M Master is priced very competitively with other Atari compatible drives. And, the C-221S Slave units are priced even lower, for truly great values in additional storage capacity.

Check out the excitement. See your authorized Concorde dealer today, and experience the value of Concorde's C-221 series for yourself. Owning an Atari has never been so exciting!

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Circle No. 119



GIFTS & GADGETS

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LifeSaver: You may feel like it is a real lifesaver when you need data recovered at the nibble level. This device checks your drive first for problems, then loads to memory. You insert a blank disk and it dumps all the retrieved data onto it. For Apple II, IIe and III computers. Price is \$25. Microlab, Inc., 2699 Skokie Valley Rd., Highland Park, IL 60036.

Circle No. 301



Computer Crazy: Another great book from Sybex. This humorous approach to computing is filled with great lines and cartoons for computerists and noncomputerists alike. Price of the paperback is \$5.95 and if you don't see it in your local bookstore, contact Sybex at 2344 Sixth St., Berkeley, CA 94710.

Circle No. 302



The Back Chair: At last, a chair designed specifically for the computer operator is available in America. Although rather strange looking, the makers of The Back Chair claim it helps relieve pain in the back, neck, hip joints and upper legs connected with long periods of sitting (CAP's typesetter confirms these claims). An ergopedic version (on wheels) is also available. Price: \$39 (\$49 with wheels). British Design, 999 Green State, Ste. 1905, San Francisco, CA 94133.

Circle No. 204



Computer Jock: This wrist wallet is for working in or out and combines a sweatband, watch and wallet into one wearable unit. It comes in blue or red and has a replaceable battery. Price is \$2. Sweet Gum, Inc., 15490 N.W. 7th Ave., Miami, FL 33169.

Circle No. 266

A printer should complement your computer, not compromise it.



It's a simple fact that your small computer can compute a lot faster than your printer can print. A problem that becomes even more frustrating in business, when your computer is tied up with your printer while you're ready to move on to other work.

Of course, the only thing more frustrating than waiting on a slow printer is waiting on a printer that's down. Unfortunately, chances are the initial printer you purchased with your computer system just isn't designed to work on continuous cycle high volume printing.

More than likely, you've already experienced one, if not both of these frustrations. But now, you can turn printer frustration into printing satisfaction with the new Genicom 3014, 3024, 3184, 3304 or 3404. Professional printers for personal computers...price/performance matched for small business systems.

Designed and built to increase productivity and maximize the value of your personal computer, the range of 3000 PC printers offers 160-400 cps draft, 80-200 cps memo, and 32-100 cps NLQ printing...performance for both high productivity and high quality printing.

The 3014/3024 models print 132 columns. The 3184, 3304

and 3404 models give you a full 136 column width, and offer color printing as well.

Each printer is easy to use, lightweight, functionally styled and attractive. And you can choose options from pedestals and paper racks to document inserters, sheet feeders and 8K character buffer expansion, plus more.

Genicom 3000 PC printers feature switch selectable hardware, dual connectors and dual parallel or serial interfaces. Plus the 3014 and 3024 emulate popular protocols for both Epson MX with GRAFTRAX-PLUS™ and Okidata Microline 84 Step 2™, while the 3184, 3304 and 3404 emulate popular protocols for Epson MX with GRAFTRAX-PLUS™. So your current system is most likely already capable of working with these Genicom printers without modification.

Most important, the Genicom 3000 PC printers are quality-built, highly durable printers designed for rapid, continuous duty cycle printing.

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Okidata Microline 84 Step 2 is a trademark of Okidata Corporation

Circle No. 125

SOUND SOLUTIONS

KEEPING IT QUIET

By Jan Zimmerman





ut of sight is not out of mind when it comes to ringing phones, ping-pong type-writers, chatting clients, clattering printers and humming fluorescent fixtures.

Whoever thought the office of the future would be a silent one was off by about 65 decibels!

Too often, the marvels of modern technology have created a "bloomin'" electronic confusion that breeds annoyance, disrupts concentration, induces errors and raises employees' stress levels. Prolonged exposure to moderate or intense noise can lead to circulatory, digestive, neurological and psychological problems, or cause permanent partial hearing loss. Although the human voice cannot produce a sound loud enough to damage the ear, a high-speed printer in a small space can reach the hazardous levels of industrial noise.

The bottom line in a noisy office: reduced productivity, efficiency and accuracy; higher employee turnover, absenteeism and medical insurance. Fortunately for company coffers — and human ears — the application of a few basic design concepts can dramatically reduce noise

levels, create a pleasant sound environment and encourage productive work.

Sounds Around Us

Unlike the sense of sight, the sense of sound cannot be closed off at will. Although the psychological phenomena of "masking" and "auditory fatigue" permit us to become so accustomed to constant background noise like fluorescent lights, nothing prevents them from becoming distracting annoyances when we are trying to concentrate on detailed work. The sporadic noise of a daisywheel printer or the unexpected ring of a phone can irretrievably interrupt your train of thought, perhaps even derailing a persuasive sales presentation.

Since spoken language carries the information that is apt to be most important to human beings, the ear is especially sensitive to the frequencies of speech, immediately drawing our attention to human or synthesized voices. Even if we don't pay attention to a ringing phone, we are constrained by physiology to pay attention when it is answered.



SOUND SOLUTIONS

The first step in improving the office soundscape is, therefore, to become aware of the sounds around us, using the human ear and human voice as the most accurate and least expensive yardstick available. R. Murray Schafer, author of *The Turning of the World*, said the easiest way to recognize an "inhuman" acoustic environment is to notice when the human voice is overwhelmed or masked, or when the ear is damaged either physically or psychologically.

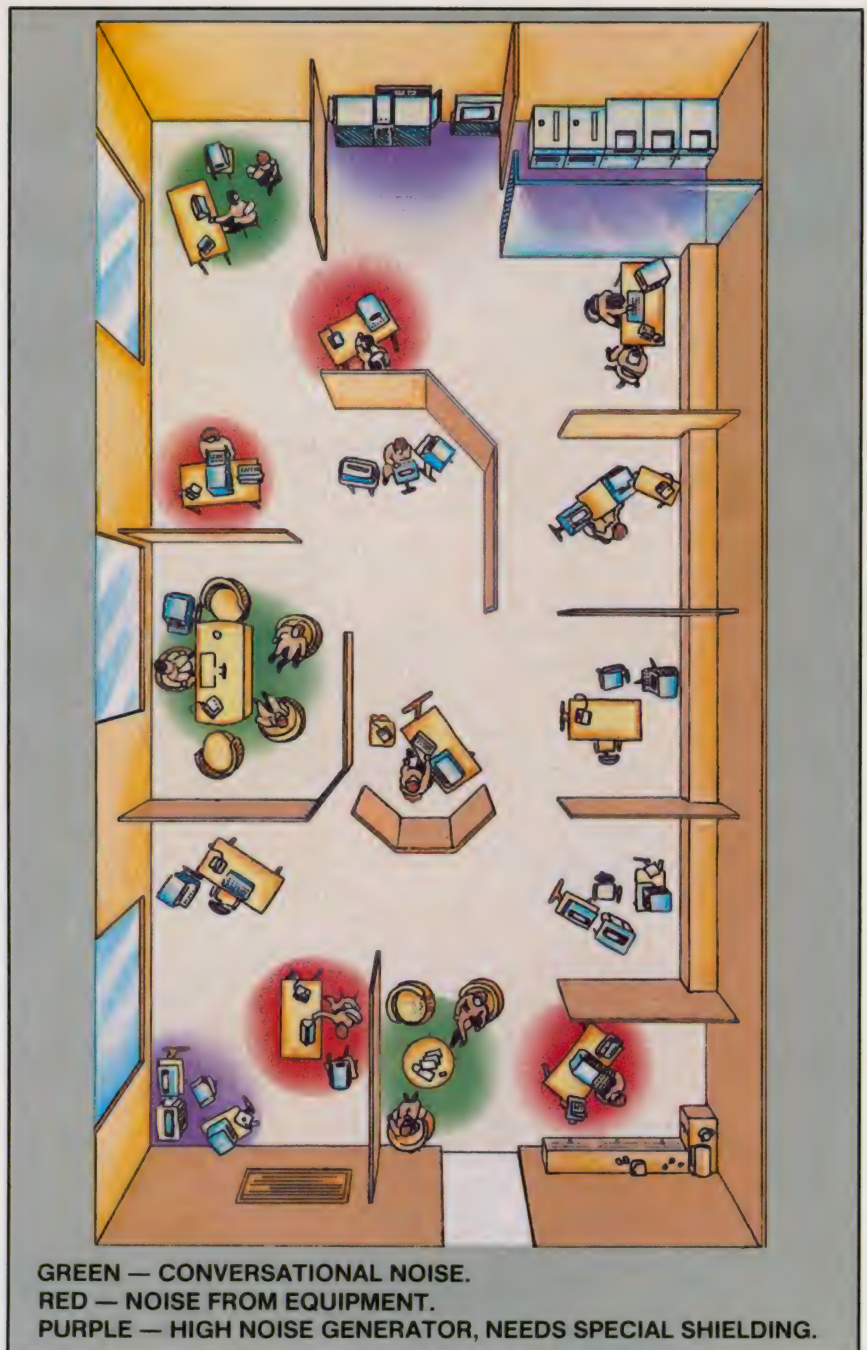
The next step is to decide what sounds we want to preserve — conference presentations, telephone calls to customers, silence — and then figure out how to eliminate the rest.

White Noise + Pink Noise = Blue People

Rather than eliminating harsh noises, some companies try to cover them up with "acoustic perfume." These masking efforts often prove to be more irritating than the noises they are intended to hide. *White noise* systems, for instance, produce continuous sounds spread equally over all audible frequencies to fill in the gaps between distractors like keyboards, footsteps and phones. The loudness of *pink noise*, often generated by air conditioners and ventilation systems, decreases in a predictable ratio at higher frequencies to distract workers from unexpected noise.

Schafer, who calls such sounds "audio-analgesia," stresses that they are not meant to be listened to consciously, any more than "canned music," which is deliberately constructed with a constantly increasing tempo, meant to provide a musical interlude. These systems create an isolating "sound wall" that actually deadens natural sounds and flattens voices, making workers uncomfortable without realizing why. People surrounded by sound walls complain that such systems give them headaches and interfere with their ability to hear normal conversation.

Because acoustic perfume ends up drawing attention to itself as an annoyance, it is a self-defeating answer to office noise. Pleasant recordings of natural sounds, like birds, crickets, rustling leaves or babbling brooks, may



prove less intrusive, but are still not as good a solution as eliminating disturbing noise altogether.

For the Discriminating Ear

The overall layout of an office is the best place to start. Are noisy pieces of equipment, like photocopiers and high-speed printers, isolated in separate rooms with special acoustic muffling? Are conversational areas (reception desks, conference rooms, meeting spaces) separated from areas where people concentrate quietly at their workstations or terminals? Can employees who need to visit with clients, customers or suppliers at their desks

do so with a reasonable expectation of privacy and clarity?

Tour your facility with your ears open, and draw noise patterns on a floor plan to identify your problem areas. Then decide if rearranging the office layout should be supplemented with other techniques to eliminate or absorb sound. To solve the noisy telephone problem, consider using flashing lights instead of rings; buy telephones with a volume adjustment on the ringer; and add call forwarding features to your next phone system to end the ringing-phone-in-an-empty-office syndrome.

Continued on Page 48



Diablo 36 Series - the right printer at the right price.

If you're looking for a low-cost, professional-quality, medium-speed printer for your personal computing needs, Continental has just what you need—the **new Diablo Series 36** daisywheel printer.

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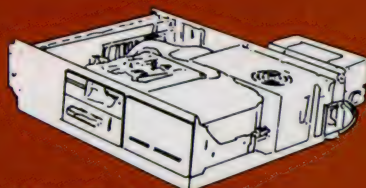
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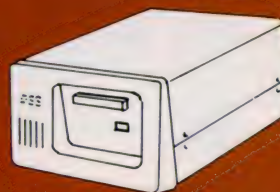
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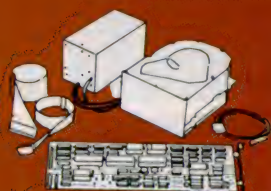
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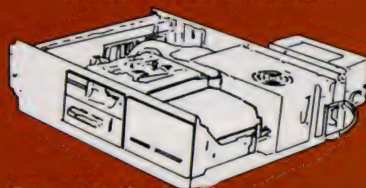
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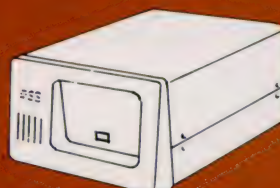
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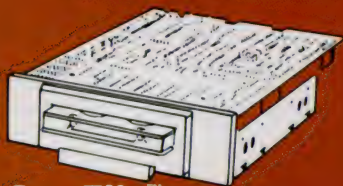
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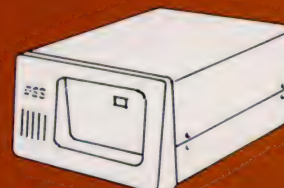
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Circle No. 199

SOUND SOLUTIONS

Continued from Page 44

On the absorption front, special acoustic enclosures for printers will reduce one of the biggest sources of noise aggravation in the computerized office; both mobile and desktop enclosures are available. Does everyone need access to a daisy wheel printer, or will a quieter (and cheaper) dot matrix printer suffice? When print quality is not an issue, consider using nearly silent thermal printers.

Common sense will tell you to avoid putting a printer on a metal table, but you may not realize that the thick felt or foam pads commonly used under typewriters will dampen vibrations from computer equipment as well. Take time to listen to the buzzes, beeps and keyboard clicks produced by your computer. Some keyboard noise is essential for user feedback, but the differences between brands are noticeable. Close your eyes and imagine the office cacophony of many units buzzing, beeping and clicking all at once.

On an environmental level, consider the installation of sound absorbing fabrics and coverings. Acoustical tile on ceilings, carpets on floors, drapes on windows and fabric coverings on walls can work the same wonders for your office as they do for quiet, hideaway restaurants. Installing an ambient lighting system will eliminate the reflection of noise from ceiling light fixtures.

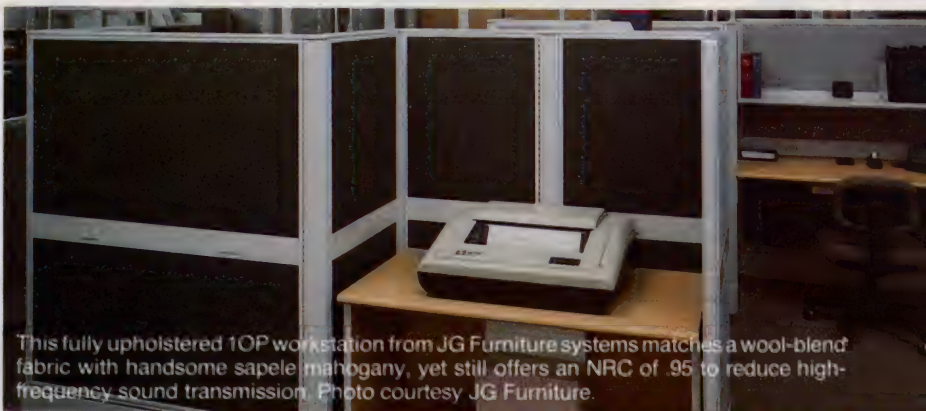
If you have an open office plan, consider whether divider panels are offering the level of acoustic insulation you need. Upholstered or fabric-covered divider panels are available in a wide range of NRC (Noise Reduction Coefficient) ratings. The NRC figure indicates how much noise a panel will absorb: the higher the rating, the more acoustic protection you receive. For maximum protection, panels can also be mounted on the back and sides of workstations. Since elegant hardwood and glass dividers readily transmit noise, save them for quiet working areas.

By keeping these basic concepts in your mind's ear, you can create a productive office soundscape that will please everyone within hearing range.

Jan Zimmerman owns Emerson and Stern, a consulting firm in Del Mar, CA.



Panel Concepts offers its 2" thick System 2Plus panels in a variety of heights and widths, fabrics, and full-or partial-vision glazed. Fabric surfaces are backed with a high-density fiberglass core for a .85 NRC rating. Photo courtesy Panel Concepts.



This fully upholstered 10P workstation from JG Furniture systems matches a wool-blend fabric with handsome sapele mahogany, yet still offers an NRC of .95 to reduce high-frequency sound transmission. Photo courtesy JG Furniture.



A well-designed acoustic environment includes sound absorbing panels, carpets, draperies, upholstered furniture, and ceiling tiles. Photo courtesy Steelcase.



avily padded panels, like these Series 00 units from Steelcase, offer excellent sound absorption. Photo courtesy Steelcase.



el Concepts' more acoustically e System2Plus panel has two 1" layers of high-density fiberglass separated by an aluminum foil septum 0.85 NRC rating. Photo Courtesy el Concepts.



Desktop printer enclosures, like this one from Viking, should offer a clear plexiglass lid, contoured foam sound insulation, a cooling fan to prevent heat buildup, and an acoustic baseboard to absorb vibrations. Photo courtesy Viking Acoustical Corp.

A Matter of Air

The equally invisible, but no less important, issues of air quality, temperature and humidity play an important role in keeping an office comfortable. Mary Sue Henifin, co-author of *Office Work Can Be Dangerous to Your Health*, points out the special environmental requirements of computerized offices.

- A computer terminal generates nearly as much heat as a person, so air conditioning levels need to be increased and heating decreased accordingly. Place workstations so that workers are not sitting too close to the back of each others' terminals.

- New office buildings are tightly sealed and weatherproofed to prevent heat loss and reduce energy costs. These buildings have lost their ability to "breathe": less fresh air enters and there is less turnover of air through the ventilation system. Consequently, indoor air pollutants, including carbon monoxide from underground garages, ozone from photocopying machines, fumes from cleaning solvents and urea formaldehyde from insulation, can build up enough to cause headache, nausea and fatigue.

- Some workers have complained of facial rashes after intensive VDT work. One suspected environmental cause, a buildup of static electricity and dust on VDT screens, can be alleviated by plac-

ing an anti-static mat under operators' chairs. Another potential culprit, low humidity (a by-product of high indoor temperatures), also contributes to eye-strain by drying out the eyes. Raising humidity levels up to 50-70% may help reduce both problems.

- The uncomfortable symptoms caused by environmental characteristics, whether noise, temperature, humidity or air pollution, appear to be synergistic with the symptoms of VDT stress. In any environment where computer terminals are prevalent, it is especially important to monitor overall environmental quality. **CAP**

Where to Shop

Haworth, Inc.
One Haworth Center
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JG Furniture Systems
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Panel Concepts, Inc.
3001 South Yale Street
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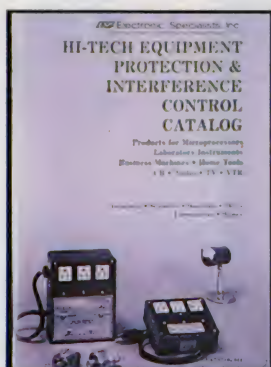
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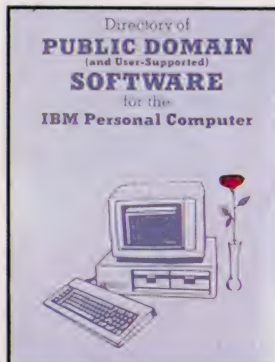
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Microcomputer Protection

This 40-page catalog has protection and interference devices to prevent damage to your system from lightning or power surges. Equipment includes AC line voltage regulators, modem and phone line surge suppressors, and equipment isolators. Electronic Specialists, Inc., 171 S. Main St., Box 389, Natick, MA 01760, 800-225-4876.

Circle No. 159



Public Domain Software

This directory for IBM public domain programs costs \$4.95, plus \$1 shipping charge. Programs were written by people who chose not to market their software. The guide tells you what programs are available, how to make free copies, and where to get them. Program listings include WP, communications, data base, games and more. PC Software Interest Group, 1556 Halford Ave., Ste. 130S, Santa Clara, CA 95051.

Circle No. 314



Office Machines

Collators, sorters, shredders and binders are just some of the products in this colorful, 58-page catalog. They also offer an office computer for applications such as issuance of sales slips to managing inventory, sales, customer cards and finances. Duplo USA Corp., 3554-E. Business Park Dr., Costa Mesa, CA 92626.

Circle No. 264



Future Advances: A Special Report

AT&T's report on advanced computer communications explores technologies that will help expand natural resources such as land, energy and minerals. The report, "Vision of the Future," describes the impact of information-age technology on society. A free copy can be obtained from AT&T. AT&T Bell Laboratories, Room 3H-234, 150 J.F. Kennedy Parkway, Short Hills, NJ 07078.

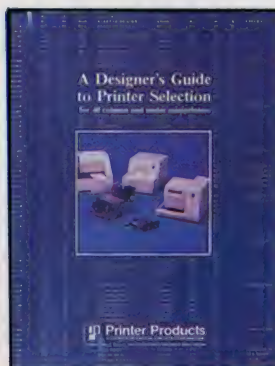
Circle No. 382



Ergonomic Chairs

The right chair makes all the difference in the world to the office worker, and this 12-page catalog tells you why and how to select the right chairs for your office. Charvoz-Carsen Corp., 5 Daniel Road East, Fairfield, NJ 07006.

Circle No. 244



Designer Printers

This catalog has a complete line of 40-column and under, microprocessor-controlled dot matrix printers for use in data acquisition, weighing systems, point of sale, telephone exchange monitors and retail, banking and medical applications. Handsomely designed, they are sold as standalone units or they can be integrated into your system. Printer Products, A division of Capitol Circuits Corp., 25 Denby Rd., Boston, MA 02134.

Circle No. 121



Workstation Accessories

This 8-page catalog describes accessories for information processing installations such as CRT workstations, desktop printer stands, computer tape storage boxes, magnetic media housing systems, forms handlers for console printers and mobile reference files. Mead-Hatcher Inc., 752 Military Rd., Buffalo, NY 14216.

Circle No. 265



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GATES

Circle No. 103

GUIDE TO ACCESSORIES AND PERIPHERALS

Classifications of products and services designed to expand your computer's capabilities and increase its usefulness.



Services

Computer-related work performed by others with special knowledge or tools.



Furniture/Accessories

Items designed to facilitate the use of computers in a particular environment.



Power Protection

Devices that protect computers and peripherals from power surges and/or loss of power.



Security

Devices or systems that prevent unauthorized access to computer processed data, or theft of hardware.



Terminals

Devices for communicating with computers, typically a keyboard and CRT screen unit.



Print Buffers/Switches

Devices that hold information prior to printing, freeing the computer for other tasks. May be internal or external.



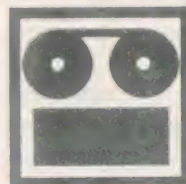
Print/Paper Feeders

Devices that translate computer output to paper copies, including letter quality and graphics.



Plotters

Devices that translate computer output to paper copies, including letter quality and graphics.



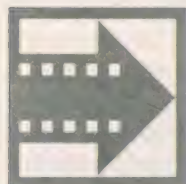
Tape Systems

Magnetic media (data) stored on reels or in cassettes or cartridges.



Modems

Devices that connect computers to telephone lines in order to send and receive information over distances.



Film Image Devices

Camera systems that capture computer display images on photographic film.



Tools and Supplies

Consumables, attachments, cleaning/ maintenance items used around computer work stations.



Expansion Boards

Add-in and add-on devices that increase a computer system's capabilities.



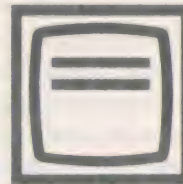
Disk Systems

Permanent data storage devices and systems that use rotating magnetic media.



Input Devices

Includes keyboards, voice and special electronic devices to speed or facilitate entry of data into computers.



Video Monitors

Display devices that permit operators to view computer output. Display may be green, amber, white, black.

PRODUCT REVIEWS

PRINTER OPTIMIZER: MORE THAN A PRINTER BUFFER



BY W. CHARLES DOHERTY

A number of devices add print-buffering to computers but few offer the flexibility of the Printer Optimizer from Applied Creative Technology, Inc. In fact, to call the Printer Optimizer a buffer does it an injustice. The device is actually a sophisticated computer and is capable of some amazing feats.

Features

The Optimizer measures 10 $\frac{3}{8}$ " wide by 3 $\frac{1}{4}$ " high by 7 $\frac{1}{4}$ " deep and weighs under 3 lbs. without power supply, which is a separate module similar to the AC adaptors used with pocket calculators.

The front panel features a power indicator lamp, a print-pause button, and a 16-key, membrane keyboard for system control and programming. There is also a three-digit LED display which indicates the amount of memory currently available within the buffer as well as showing program instructions as they are received from the keyboard.

Used in its simplest form, the Printer Optimizer acts as a 64 K buffer between computer and printer. If you need a larger buffer area, the Optimizer will accommodate as many as three additional plug-in storage modules of 64 K each, bringing the total capacity to 262 K. These boards may be added at any time.

Getting fancier, the Optimizer can be programmed to substitute one character (or sequence of characters) for another. You can also substitute printer control codes in response to certain data from the computer. Tell the Optimizer to substitute the appropriate printer commands for the word "italics," for example, and it will switch your printer into the italics mode whenever that word is encountered. Each of these tasks is performed by a translation equation such as "X = Y" (which

would cause the Optimizer to replace every X with a Y).

The Printer Optimizer also includes alternate storage areas within the buffer memory. Data can be routed into and out of these sections as needed, letting you change the order in which received information is printed. This also permits multiple copies of a document to be produced, by routing the information to one of the alternate storage areas and sending it to the printer as many times as necessary.

The stock configuration is a Centronics Standard parallel input and output. An optional board adds an RS232C serial input and output as well. An Optimizer set up this way — as was my test unit — can control two printers (one parallel and one serial) and accept data from two different sources. Other options allow a third printer output as well.

Installation

Using the Optimizer with a parallel input and output requires almost no installation — just connect the cables and you are ready to print. A serial connection is considerably more complex. Internal dip switches set the baud rate, parity and handshaking type required for your printer (or computer).

The manual shows the required switch settings and pin configurations for a number of popular serial printers, but you may be in for some detective work if yours is not among them. My

serial printer was not listed, and it took the better part of an evening to get the various parameters correct.

Performance

I used the Printer Optimizer with an Apple IIe computer and two printers. It performed well, faithfully executing all instructions.

After using the Optimizer for awhile, I began to appreciate some of its more exotic functions. The multiple storage areas were especially helpful; I found that I could work more efficiently by using them to change the order in which data was printed.

The Optimizer also allowed me to use special printer features such as italics and double-width characters, which are not supported by my word processor.

Ease of Use

Features offered by the Optimizer, and its instructions, range from simple to complex. The most basic functions require no input from the operator at all, but using the machine to its full potential could be a difficult task.

The keyboard commands take some getting used to as well. For example, a key marked "STO" means to "store" a command in some situations but can refer to an alternate storage area at other times. Learning the proper command structure is not easy.

The Optimizer is not difficult to use once it is completely set up and programmed.

Error Handling

Almost every command you give to the device will be accepted, whether it makes sense or not, so it is important to double-check every instruction beforehand. A mistake in programming may result in a command being ignored



or cause some rather bizarre results.

A "status report" command sends all of the current translation equations and system status to the printer, producing a printed report of the Optimizer's condition. Unfortunately, this report shows only the ASCII values of whatever is in memory, making it a bit hard to decipher.

If you do have a problem, a self-test function can determine whether the cause is from the device or from an outside source.

Documentation

A 65-page, loose-leaf manual is provided with the Optimizer. The manual is a good source of technical information but, like the rest of the system, can be a bit overwhelming for an inexperienced user.

Support

Applied Creative Technology provides a technical support telephone number for Optimizer owners. The staff was helpful and friendly when I called about my installation problem, but were no

more familiar with my printer's requirements than I was. They did point me in the right direction, however, and helped locate the area of trouble.

The Optimizer comes with a one-year warranty on parts and labor. If the unit should require service your dealer cannot perform, ACT will issue a return authorization number for factory repair. If this is the case, the manufacturer also requires a \$10 shipping and handling fee to accompany the defective unit.

Summary

The Printer Optimizer is a very flexible device which can help you to work more efficiently while enhancing the performance of many printers. Initial setup is tricky, so I would recommend purchasing this unit from a dealer who will help you to get it working properly, unless you are *quite* technically minded.

The Printer Optimizer would seem expensive if viewed *only* as a print-buffering device, but if you consider the many additional features it pro-

vides, the price is well justified. If you find yourself wasting time and effort because of your printer's limitations, the Printer Optimizer may be just what you need.

W. Charles Doherty is a freelance writer and consultant for business microcomputer applications.

PRINTER OPTIMIZER

FEATURES	10
INSTALLATION	7
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EASE OF USE	7
ERROR HANDLING	7
DOCUMENTATION	7
SUPPORT	9

Applied Creative Technology, Inc.
2156 West Northwest Highway, Ste. 303
Dallas, TX 75220
PRICE: \$499

Circle No. 135

QUME TERMINALS FOR BUSINESS NEEDS



BY LINDA GAIL CHRISTIE

Qume provides four terminals that fit almost any business need.

Clerical Workstation

The QVT-102 is primarily designed as a clerical workstation. The terminal emulates the Hazeltine 1500, Lear Siegler ADM 3A/5, and Televideo 910 terminals. In addition, the 102 has block and conversation modes, local editing, a 25th status line display, a menu set-up mode, eight user-programmable functions and four preprogrammed functions. The auxiliary RS232C port provides unidirectional, partial-/full-screen copy to a printer.

The 102 displays 24 lines by 80 columns with each character occupying a 9 x 12 cell (7 x 9 dot matrix). The 12" non-glare green monochrome (optional amber) screen offers blinking,

blanking, underlining, reverse video and half intensity.

The 102 touch-quality, detachable keyboard has four function keys to implement 12 function calls, a numeric pad, a defeatable auto-repeat and key click. The swivel/tilt screen is very attractive and comfortable to use.



QVT-102

Added Versatility

The QVT-103 emulates Digital's VT 52, BT 100, and VT 131 terminals. In addition, it provides two pages of screen memory that is expandable to four pages. The 25th status line is defeatable by user command. The 103 displays 24 lines by 80 columns and up to 132 columns for wider financial reports. The screen resolution is similar to the 102; however, the 14" non-glare green monochrome (optional amber) surface is larger. This terminal also provides blinking, blanking, underlining, reverse video and half intensity features. The bidirectional, buffered RS232C auxiliary port is available for screen copy.

The touch-quality, detachable keyboard contains a numeric pad, four function keys for 12 operations, a defeatable auto-repeat and key click.

QUME TERMINALS



QVT-103

The ergonomically designed tilt/swivel base makes this unit very attractive and easy to use.

From the Routine to Management

The QVT-108 is a very flexible unit that can handle everything from routine jobs to management level tasks. The 22 user-programmable function keys, 12 editing functions and menu setup mode make this terminal efficient and user-friendly. The 25th status line is user-defeatable.



QVT-108

The 108 emulates the Televideo 925 and the Televideo 912/920 terminals. It has a 24 line by 80 column, 12" (optional 14") non-glare green monochrome (optional amber) display. The bidirectional auxiliary port has four modes: RS232C serial, parallel, transparent and screen copy. The detachable keyboard has a numeric pad, 11 function keys (22 functions), 12 editing keys, a defeatable auto-repeat and key click.

The tilt/swivel base is very attractive and makes viewing easy.

Business and Technical Graphics

This terminal delivers advanced vector graphics including arcs, circles, lines and boxes. The terminal has 15 line-drawing symbols and 32 control character symbols. It also offers a library of PLOT-10 compatible subroutines which speeds the development of graphics applications programs from Tektronix Corporation. The Model 211GX has full interactive vector graphics, a separate display memory for graphics, and absolute and relative addressing. It can draw lines, boxes, arcs and circles, perform area fill, and display a cross-hair cursor. The 211GX is ideal as a preview terminal for CAD/CAM applications since it emulates the Tektronix 4010 and 4014 command sets. The terminal also emulates the Hazeltine 1500, Televideo 910 and the Lear Siegler ADM-3A/5.

A 14", non-glare green monochrome (optional amber) screen displays 24 by 80 columns. Character attributes include blinking, blanking, underlining, reverse video and half intensity. The screen resolution is 644 horizontal by 288 vertical increments and the addressable screen area is 2500 X 2000.

A serial RS232C bidirectional auxiliary port has partial-/full-screen copy

capabilities. The detachable keyboard has a numeric pad, 12 function keys (8 programmable), defeatable auto-repeat and key click.

The 211GX also is mounted on an attractive tilt/swivel base for easy viewing.

Summary

The Qume series of terminals will fit almost any business need. They are well built, attractively designed, and functional. Each model emulates the most popular CRTs in its class, therefore they fit a wide variety of computer configurations, applications, and budgets.

Linda Gail Christie is the author of *The ABCs of Microcomputers* and *The Encyclopedia of Microcomputer Terminology*. *The Buyer's Guide to Personal Computer Peripherals* will be released this fall.

QUME QVT TERMINAL SERIES

FEATURES	9
INSTALLATION	8
SUPPORT	9
DOCUMENTATION	8
COMPATIBILITY	9
PERFORMANCE	9
EASE OF USE	9
ERROR HANDLING	9

Qume
2350 Qume Dr.
San Jose, CA 95131

PRICES:
QVT-102, \$695
QVT-103, \$1,095
QVT-108, \$895
QVT-211GX, \$1,295

Circle No. 190

VEN-TEL PC HALF-CARD FOR A SHORT SLOT

BY HARRY KRAUSE

One legitimate gripe about the IBM PC is its shortage of expansion slots. PCs have only five slots, and by the time you install a monitor board,

a disk drive controller, a game controller and an expansion board, you're pretty close to being "expanded out."

Recognizing this, IBM used a modi-

fied bus design for its PC XT, giving users a total of eight expansion slots. But IBM still didn't get everything right. The eight expansion slots are



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VEN-TEL MODEM

closer together, which required some add-on card designers to thin down their boards. Further, one of the slots is only half the length of the others. "Shorty" is Slot 8, closest to the XT's power supply. It didn't take long for one add-on manufacturer, Ven-Tel Inc. (Santa Clara, CA), to figure out what should go in the short slot—a 1200/300 bits per second (bps) modem card.

For \$549 (about average for an internal modem with full features), Ven-Tel's PC Modem Half-Card takes care of the short slot. It keeps the clutter and distraction of an external modem off your work space and bundles in Crosstalk-XVI software, a very powerful communications package. The Ven-Tel product also is compatible with the IBM PC, Compaq, Eagle PC-2 Plus and probably many other PC workalikes.

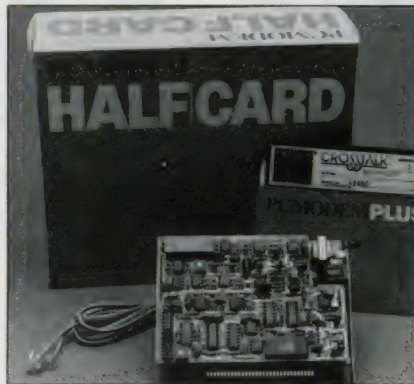
Installation

Installation in an IBM PC or PC XT is simple and straightforward. There's plenty of help in the product's documentation manual. It may take longer to describe the process than you'll take to actually install the Half-Card!

First unplug your computer and any peripheral devices connected to it from your AC outlets. Any time you're poking around in the innards of a personal computer, it should be disabled electrically, unless you are trying to trace a circuit. While your chances of receiving an electrical jolt are slight, you could accidentally drop a screw or press one gizmo against another and zap your machine.

For the PC XT, remove the screws on the lower rear panel, and slide the cover forward and off. Gently push the Half-Card modem into place in the short slot. One screw at the back of the computer (which formerly held the blank panel insert) is used to secure the Half-Card to the machine's frame. Slide the cover back and refasten the screws. You're almost finished. The only remaining thing to do is to connect one end of the modular phone cord supplied with the Half-Card to a phone jack outlet, and the other end to the jack on the back of the Half-Card. The Half-Card's phone connection protrudes slightly from the back of the XT.

Since an internal modem draws electrical power from the computer itself, there's no external transformer or power cord. Reconnect your XT and its peripheral devices to the AC outlets and the hardware installation is finished.



The Half-Card, however, does have some switches and jumpers, and if you want a configuration different from the factory's defaults, you'll have to flip a switch or move a jumper. There are only a couple of reasons for doing this, and none are really significant; most users can leave the factory settings as they are. If you need to make changes, the documentation has clear drawings, photographs and prose, so any modifications should be easy to make.

Installation in an IBM PC is the same as for the XT, but you can use any vacant slot if you uncap a small jumper on the side of the Half-Card. You can also use the board in any slot on the XT if you uncap the jumper, but it is difficult to imagine why you'd want to use the Half-Card elsewhere.

Installation in the Compaq follows identical procedures, except removing the case of a Compaq is not as easy.

If you've got a PC compatible with two RS232C ports, your installation procedures are a little different. Many compatibles have two ports built in, which is an advantage over the IBM machines (which have none). The compatible Eagle PC-2 Plus, for example, has two RS232C ports configured as Com 1 and Com 2. But you can move a jumper on the Eagle's motherboard to change the address of the Com 1 port, freeing up Com 1 for use by an internal modem. This is a minor adjustment which should not take more than a minute.

You also have to make a working copy of the Crosstalk diskette. Since

normal PC DOS procedures are followed, this presents no problem. Simply format a blank diskette (include the System files) and then copy everything off the Crosstalk master diskette onto your working copy. File the Crosstalk master diskette in a safe place, because if updates are issued, you'll need to send in the master to get them. The master diskette, incidentally, is not copy protected, which is a plus.

How did Ven-Tel make a modem board half the length of everyone else's? Simply stated, the company designed a full-length board in two half-length sections and joined them together. The Half-Card actually is two cards on a single mounting, and is not much thicker than the average full-length, multi-function card.

Perhaps a few words about manufacturing quality are in order here. After examining the Half-Card, one can only conclude Ven-Tel is no Johnny-come-lately to the hardware business. The board is clean, the connections are secure, the more delicate components are protected and no obviously cheap methods have been used. Further, there are no extra electrical traces on the circuit board and no jumpers are used to patch mistakes. I've seen some boards that looked as if they were held together by a prayer and chewing gum, but this isn't one of them.

Performance and Ease of Use

Evaluating a modem is pretty black and white. Either the product works or it doesn't. A modem that works responds correctly to software commands and is as transparent to the user as possible. A modem, after all, is simply a device that hooks your computer up with another, usually via telephone line. What's important is the data you send or receive over that phone line. The modem's job is to make sure the transfer works smoothly and correctly.

The best test of a modem's performance is to see how it works with software. Ven-Tel packs in Crosstalk. Full documentation on the program is in the manual, but it isn't something you'll learn to use in an hour or two.

I used a familiar program, PC-Talk III, to initially put the Half-Card through its paces. PC-Talk III is probably the most ubiquitous modem program for the IBM PC and its clones; it

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Circle No. 124



NOVATION



VEN-TEL MODEM

is available for \$35 from Headlands Press, Inc. (Tiburon, CA).

Using the Half-Card with PC-Talk III presented no problems, because the software program and the modem both use standard modem commands. I used the Half-Card to automatically dial several commercial data bases, a few local bulletin boards, a long distance bulletin board and to transmit text and program files. The Half-Card worked perfectly with all functions at both 300 and 1200 bps.

The Crosstalk program has some features PC-Talk III omits, such as terminal emulation, unattended operation and fully automatic log-on.

One hardware feature I'm used to is missing from the Half-Card. My modem (an external model) has a built-in speaker so I can monitor the progress of a call, i.e., is the line busy? ringing? etc. There's no speaker on the Half-Card, so you have to depend on reports from the software that appear on your screen. The missing speaker, however, is not a big deal; most of the time I have the volume on my modem turned off anyway because the phone tones that come through are sometimes annoying.

Error Handling

Aside from user errors, the only problems one usually encounters with a modem are created by noisy phone lines. Sometimes while transmitting or receiving data, you'll see extra letters or garbage on your screen. Any time

there is an electrical storm in my area, I see this junk on my screen. Sometimes electrical interference will break your connection. The Half-Card handled the garbage the same way my personal modem handles it . . . sometimes you keep your connection and sometimes you don't.

User errors result from giving the wrong software command. If the software has decent recovery procedures (PC-Talk II does), you'll be able to straighten out whatever mess you've created. The modem itself is rarely at fault.

Support

The Half-Card worked right out of the box, exactly as the manual said it would. I called the toll-free number listed on the product literature and asked a few questions about configurations. The correct answers were given immediately. Ven-Tel offers a one-year limited warranty on its products.

Documentation

Ven-Tel's documentation is well written, complete and nicely organized and illustrated. There's a full table of contents and an index of commands. The manual includes separate sections on modem installation and operation, and operating instructions for Crosstalk. The front of the manual tells you what you need to know to get started; as you get more proficient, you can delve into the back pages, which provide detailed instructions on programming the modem and getting the most out of Crosstalk.

Summary

IBM PC XT owners who have been wondering what to do with that short slot on their machines can now fill it with a quality product. The Ven-Tel Half-Card modem is a well-assembled and well-documented product. It can also be used with IBM PCs or compatibles.

Harry Krause is the owner of Krause & Associates, a microcomputer consulting firm in Great Falls, VA.

VEN-TEL PC MODEM HALF-CARD

FEATURES	10
INSTALLATION	10
PERFORMANCE	10
EASE OF USE	*
ERROR HANDLING	10
SUPPORT	10
DOCUMENTATION	10

*Ease of Use

A modem's Ease of Use is determined more by the software than the hardware. With PC-Talk III, an "easy" software package, the Half-Card would rate a perfect 10. Ven-Tel, however, bundles in a top-of-the-line commercial software package, Crosstalk-XVI. While this software provides more features than PC-Talk III, it is not nearly as easy to use. I would give the modem a 10, but Crosstalk an 8.

Ven-Tel, Inc.
2342 Walsh Avenue
Santa Clara, CA 95051
PRICE: \$549

Circle No. 372

ROLAND'S MONOCHROME MONITOR FOR IBM



BY NED HEITE

First-time computer buyers are often surprised to learn that the video display screen, or monitor, is neither part of the IBM personal computer package nor included in its base price. Everything except the central processing unit is, in fact, an

add-on accessory.

Perfectly adequate non-IBM components can be substituted for Big Blue's accessories, without endangering the warranty or serviceability of your system. Less expensive substitutes may often be equal or superior to

the standard items. Such is the case with the Roland monochrome display monitor.

Features

The Roland MB-122 monitor is a 12" video display available with green or

amber characters. At 15 lbs. 7 oz., it is lighter than IBM's monitor and slightly smaller. The cabinet color closely matches IBM's.

Its styling is clean; control knobs and buttons are recessed, giving the unit an uncluttered appearance. The on-off button is partly concealed in the bezel around the screen. The brightness control knob is recessed under the bottom edge. Hold and contrast controls are on the back.

Installation

Two cables project from the back of the cabinet. The signal cable attaches to your IBM computer with a connector identical to the one used by IBM; it requires a screwdriver. The power cable is a lightweight, two-conductor household cord. It cannot be plugged into the monitor power socket on the back of the IBM computer, which requires a commercial weight, three-conductor cord. The monitor must therefore be plugged into a separate outlet. I attached it to a Lime protected power cable together with the computer and the printer.

Performance

The screen display of the Roland monitor is at least as clear as the IBM monochrome monitor. The characters and other images are indistinguishable from IBM's.

The Roland monitor should be applauded for clarity, definition, and overall readability of text display.

Ease of Use

The power switch, a pushbutton, is the only control most users will ever need.

It is on the front bezel and has a small power-on indicator light. The brightness control, half-hidden under the front edge, is easy to reach.

Vertical hold and contrast knobs on the back are easily accessible. The horizontal hold, which only a technician should touch, must be adjusted with a screwdriver.



Documentation

Unlike many imports, the Roland monitor is shipped with clearly written documentation in a reasonable approximation of colloquial English. There are a few puzzlers, such as, "If opening the cover and touch inside, you may get an electrical shock." But I think the intended meaning still comes across.

The eight-page manual does not contain the company's address or telephone number, which are necessary elements in the documentation of a properly supported product.

The documentation does have, however, clearly drawn illustrations to show every part of the unit, including the signal cable's pinout diagram. Each control and cable is explained.

Compatibility

Aside from the problem with the power

cord, the monitor is fully IBM compatible. It behaves in all respects exactly like the IBM monochrome monitor. Although the screen is the same size as IBM's, the cabinet is smaller. It may, therefore, require different glare screens, dust covers, or other accessories.

Summary

The lack of a manufacturer's support phone number and address is the only cause for hesitation in recommending this monitor as a substitute for the IBM monochrome screen.

Ned Heite teaches business information systems at the University of Delaware and consults in the fields of information systems, archaeology and history.

ROLAND MB-122

FEATURES	9
INSTALLATION	7
PERFORMANCE	9
EASE OF USE	8
ERROR HANDLING	N/A
DOCUMENTATION	8
COMPATIBILITY	9
SUPPORT	5

Roland DG Corp.
7200 Dominion Circle
Los Angeles, CA 90040
PRICE: green, \$225
amber, \$240

Circle No. 371

SHUFFLEBUFFER CARD RAISES THE I.Q. OF YOUR PRINTER



BY HARRY KRAUSE

Here's a little two-part math and schedule problem to start off your day: How long will it take a 25 cps daisy wheel printer to produce a 20-page report, assuming there are 60 characters per line and 60 lines per page?

If you guessed 48 minutes, you've

got the math part correct. The second part is a little trickier. What do you do while the printer has control of your computer for 48 minutes?

Any answer here is correct. If you have to turn out a long report, or even a series of short ones, and you don't

have an intelligent buffer controlling your printer, your printer is controlling you.

Recognizing this, some printer manufacturers have built a small buffer into their products. A printer-cum-buffer will usually hold a page or two of text,

SHUFFLEBUFFER

and will relieve some of the logjam. Another solution is to configure part of your computer's memory as a print spooler, but unless you have scads of extra memory in your machine and the ability to reconfigure it easily, this approach may not be practical.

Interactive Structures Inc. has gone far beyond producing a simple buffering device, and if your printed output is lengthy or complex or occasionally incorporates charts, spreadsheets or personalized form letters, you'll want to take a close look at their ShuffleBuffer.

Features

In its simplest mode, the ShuffleBuffer is nothing more than a printing buffer, albeit a large one, with a capacity that can be expanded from 32 K to 128 K of RAM. Fully populated, the ShuffleBuffer can have more memory than many personal computers, and it can store 50 to 90 pages of text, depending on how densely you pack your pages. In this mode, the ShuffleBuffer is a FIFO (first in/first out) buffer, acting as a reservoir, accepting data as fast as the computer can transmit it, and printing it as fast as the printer permits. Most buffers do nothing more than provide a FIFO mode.

By touching a couple of pressure-sensitive switches on the ShuffleBuffer's front panel, however, the device goes into its RAP (random access printing) mode, and acts as an intelligent processor for storing phrases, passages, entire letters, graphics and commands. It will then print out the information in whatever order you like. Each chunk of information entered in the RAP mode is specially labeled by the user with a one-letter-or-number name and is sent to an individual ShuffleBuffer "bucket," which maintains the information. Commands can then be sent to the ShuffleBuffer to choose which buckets to print and in what order. Any bucket can be printed more than once.

ShuffleBuffer's control panel has five touch-sensitive keys, and the entire panel is covered by a plastic sheet. The panel looks like a junior-sized version of those new electronic cash registers found at fast food franchises.

The Bypass key lets your computer transmit directly to the printer, without the input being buffered.

The FIFO key puts the ShuffleBuffer in the first in/first out storage mode so it acts like any other printer buffer.

The RAP key selects the random access printing mode. There's also a Verify key to signal the device to enter a mode you've selected and an Erase key which, obviously, erases whatever is stored in the buffer's memory. To protect against accidental erasure, the Erase key works only when you press the Erase and Verify keys at the same time.

The control panel also has two status lights. One glows to indicate power is being supplied to the unit. The other, the Status light, supplies the user with three kinds of information: a steady glow indicates ShuffleBuffer is in the Bypass mode, a slow flash indicates a memory overflow while filling the memory in the RAP mode, and a fast flash indicates a RAP mode graphics fill-up sequence.



Installation

ShuffleBuffer is packed as a complete device. You get the necessary cables, power supply (transformer) and a comprehensive documentation manual with the unit.

When buying ShuffleBuffer, you'll need to specify whether your computer and printer use parallel or serial input/output ports. The device itself is universal, but cables are not. If your computer's printer I/O port is serial and your printer is parallel, you can connect through the ShuffleBuffer and your computer and printer will talk to each other. Documentation in this area is complete and clearly illustrated by line drawings.

Because I was especially cautious and took notes as I did the installation, the installation process took 20 minutes.

It was not complicated and the directions are very clear. But if you are at all intimidated by electronic things, you probably should have your dealer check internal shunt and switch settings.

Configuring a serial printer is a little more complicated, but the basic process is the same.

Support

The manual lists the manufacturer's address and phone number, so I invented a problem, called and spoke with a fellow who gave an immediate (and correct) answer to my question. The phone number was not toll-free.

ShuffleBuffer is supplied with a one-year limited warranty. If it fails, it should be shipped back to the manufacturer; they will repair it (or replace it) and ship it back. Interactive Structures Inc. has been in business for over 10 years and has a number of other products on the market.

Performance

If you've been suffering with a fast computer and a slow printer, you'll quickly become a fan of any printer buffer. But if your printing needs are complex, you'll love the ShuffleBuffer.

In its FIFO mode, the ShuffleBuffer is transparent to the user. My print files from my Eagle computer went directly into the ShuffleBuffer's reservoir, and I regained immediate control of the computer. Even a 120 K file on the Eagle with a word processing package was soaked up in only a few seconds.

ShuffleBuffer is not as user-transparent in the RAP mode. You have to tell the device exactly what to do. There are several ways to program it, and all require a little thought and practice. I call it learning the "ShuffleBuffer Shuffle."

Remember those buckets I mentioned earlier? You have to name them, fill them, and then tell the ShuffleBuffer the order in which to print them.

The process is a bit complex. Once you are familiar with the technique, however, you can spend your time on business instead of trying to outguess your printer or word processor.

RAP commands can also be sent to the ShuffleBuffer with simple Basic programs, and there are a couple of examples in the documentation to

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SHUFFLEBUFFER

modify. What you'd be doing is writing a small routine that would read characters from the keyboard and send them to the ShuffleBuffer.

I spent a few hours playing around with files and ShuffleBuffer commands, and found it was easy to send them directly from the Eagle's keyboard by using a "Control-Print" sequence. This toggles on the printer so it accepts input directly from the keyboard. I tested every example shown in the ShuffleBuffer documentation and they all worked as described.

Ease of Use

In the FIFO mode, ShuffleBuffer is simple and direct. It soaks up your computer's output and spoonfeeds it to your printer at a rate your printer can digest.

For a beginner, the RAP mode is complicated. It is very powerful and takes some time to learn. But if you've mastered a spreadsheet or even WordStar, you're already well along the learning curve. Give ShuffleBuffer a little time and practice and it will reward you by freeing up your com-

puter and giving you back total control over printed output.

Error Handling

First-time users of the RAP mode are going to make mistakes. But no serious damage is done, because data you send through the ShuffleBuffer already exists in permanent form on your diskettes or hard disk — you can always reload the ShuffleBuffer.

There are a couple of conditions that might lead to an overflow on the device, but they are pointed out in the documentation and recovery is possible.

Documentation

ShuffleBuffer arrives with a hefty manual. It is full of clear diagrams, examples and instructions. It is decently written, contains a minimal amount of jargon and answers virtually any question that arises. The manual has a table of contents and an index.

Summary

If you need a printer buffer with an expandable memory and extensive programming capabilities, you'd be hard-pressed to find a product more versatile than ShuffleBuffer. It is well-made, well-documented and performs the

tasks it is advertised to do. Learning to take full advantage of the device takes time, but the investment pays off by freeing your computer for other work while printing, giving you complete control over your printer.

Harry Krause is the owner of Krause & Associates, a microcomputer consulting firm in Great Falls, VA.

SHUFFLEBUFFER

FEATURES	10
INSTALLATION	9
SUPPORT	9
PERFORMANCE	10
EASE OF USE	8
ERROR HANDLING	9
DOCUMENTATION	9

Interactive Structures Inc.
146 Montgomery Avenue
Bala Cynwyd, PA 19004
PRICE: 128 K, \$445
64 K, \$349
32 K, \$299

Circle No. 148

CONSOLINK MICROPOOLER



BY HARTLEY G. LESSER

As the hour set for office closing draws near, with still five more critical memorandi requiring writing, editing and printing, you stand and wait. The printer is still interminably printing your first lengthy letter.

Thankfully, peripherals known as buffers have aided the printer-bound and frazzle-worn letter writers of the business environs. By accepting and storing data directly from the computer, these buffers manage the output to the printer, freeing the computer for other work. As your first manuscript is being printed, the second letter can be written, edited and dumped into

the buffer without hesitation. Consolink's intelligent Microspooler is an asset for modern times.

Features

Being of vertical stature, Microspooler can fit your workstation no matter how crowded an environment might be. A two-digit numeric display on the face of the buffer reveals how much data has been stored in the unit's memory, which is available in 64 K, 128 K or 256 K configurations. A Copy/Pause and Reset pushbutton are conveniently located beneath the numeric display.

Serial-to-serial, serial-to-parallel, parallel-to-serial and parallel-to-parallel models are available, depending upon which configuration best suits your present needs or future considerations. For those who utilize one of the three serial configurations, dip switches, or position switches, must be set to properly control the necessary protocol requirements of your computer and peripherals. But here Consolink manages thoughtful consumer consideration. These switches are found by turning the Microspooler onto its side and locating the recessed switches through an open "door" in the base of

the unit. Either a bent paper clip or a small pointed tool can change any switch from on to off without problem. No more removing of an external cover to configure the unit for your equipment. Multiple copies are possible and there is a self-test that checks the Microspooler's Read Only and Random Access Memory. An 8048 microprocessor controls the Microspooler.

Performance

The review model was of the serial-to-serial type and operated flawlessly. Two 8 position switches controlled the baud rate as well as parity, word length, stop bits and handshaking protocol. This configuration should meet most user's requirements. However, a serial baud rate switch chart and serial handshaking and word structure chart are included in the documentation and provide the information for simple alterations, if needed. If multiple copies of a document are required, this is handled by waiting until the Microspooler is in full reset and registering a "00" in the numeric display. By pressing the Copy/Pause button once for each copy needed, you may input as many as 99 copies to be printed.

Installation

You must make certain you have the necessary cables to attach to the Microspooler, as the unit arrives sans cables. The documentation indicates this is due to the lack of industry standardization in interconnective devices. A parallel unit will require a standard 36 pin Centronics-type receptacle... but don't forget, you'll need one from your computer to the Microspooler and one from your Microspooler to the printer. The same holds true for the serial ver-

sions... unless you happen upon a system that doesn't use the standard DB-25 connectors and EIA RS232C standard pinout configuration. If such is the case, consult your friendly dealer for assistance. If all seems in order, simply connect cable to unit and cable to printer and power-up.

Ease of Use

For direct document printing, once Microspooler is on, the data is stored into the unit's memory and is passed to the printer. Nothing could be simpler. Data untouched by human hands. Learning how to "program" the Microspooler for multiple copies takes less than four minutes of documentation reading and one or two minutes for implementation.

Error Handling

This is not applicable. Either the unit works, or it doesn't. If not, simply return to the company for a full replacement or refund.

Documentation

Every aspect of use is adequately covered in the documentation, which includes position switch diagrams and charts. For those technically inspired, a specifications chapter details such items as parallel input/output port timing and pinout and signal descriptions.

Support

There is a toll-free independent telephone number for customer support. There is a one-year limited warranty, and the unit may be returned within 30 days for a complete refund if you're not satisfied with the product. Consolink has little to fear in this regard. The company telephone number in Colorado is listed on the inside front cover

of the documentation and a call provided technical assistance regarding dip switch settings for a serial-to-serial configuration.

Compatibility

The review unit was tested on both an IBM PC and Apple IIe, interfaced to two serial printers and found compatible with both units.

Summary

Consolink's Microspooler is a most appropriate peripheral for anyone who wishes to maximize his use of time. The unit worked as advertised, is simple to use, maintains a true accounting of internal memory being used as a buffer, and can print multiple or single-sheet copies. As an intelligent buffer/printer interface, Microspooler is highly recommended.

CONSOLINK MICROSPOOLER

FEATURES	10
INSTALLATION	9
PERFORMANCE	10
EASE OF USE	9
ERROR HANDLING	N/A
DOCUMENTATION	9
SUPPORT	8
COMPATIBILITY	10

Consolink Corp.
1840 Industrial Circle
Longmont, CO 80501

PRICE:

Parallel-to-Parallel, \$309, 64 K
Parallel-to-Serial, \$339, 64 K
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Serial-to-Serial, \$349, 64 K

Circle No. 144

HESMODEM1: COMMODORE LINK

BY LOUIS F. SANDER

HesModem1 is an inexpensive direct-connect modem for the Commodore 64 and Vic-20 computers. As telecommunications becomes in-

creasingly important in today's business environment, many businesses are incorporating these low-cost machines into the office for use with modems. By

using the modem and included software, Commodore owners will be able to explore the world of computer-to-computer communications.



HESMODEM

Features

HesModem1 operates at 300 baud, in originate or answer, full- or half-duplex modes, and is extremely easy to use. It comes with three versions of an excellent cassette-based communications program, and is compatible with a variety of either communications software for disk or cassette.

The modem is housed in a small plastic case that plugs into your computer's user port. A modular jack on the modem accepts a standard telephone cable, which you remove from your handset once computer communications have been established. A 'carrier detect' LED atop the case remains lit as long as the distant computer is providing a carrier signal; if the LED goes out, you know that communication has been disrupted.

The only control on the HesModem1 is an originate/answer switch which lets your computer either originate calls to a host or answer calls from another computer. In almost all practical cases, users will leave it in the originate position.

Software provided with the modem is Midwest Micro's Terminal Software Package, in versions for the unexpanded and expanded Vic and for the Commodore 64. The two larger versions of this tape-based program are full-featured packages, with smooth screen scrolling, color or B&W display, and many communications control features. They also include large text buffers, allowing the user to store incoming text in memory and to review it later at his convenience. The version for the unexpanded Vic has fewer features.

Also included with HesModem1 are a CompuServe demonstration pack and an advertisement for Midwest Micro's SuperTerm software package. The CompuServe demo lets you learn about computer communications in a live, though limited, setting, and the ad package lets you see the greater possibilities available to you with more sophisticated software.

Installation

Installing HesModem1 was simple,

straightforward, and well-described in the manual.

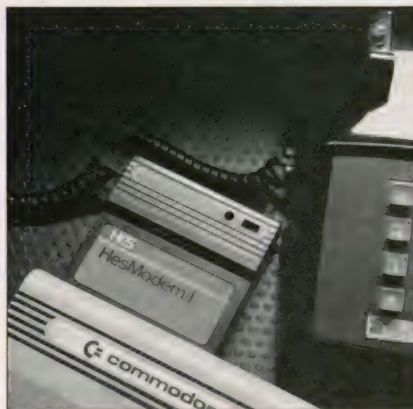
Support

A telephone number was provided on the box and in the documentation, and a call was received by a courteous and helpful customer service staff. A toll-free number is available but is not listed in the package material.

Performance

HesModem1 performed to expectations in every way. Once we learned how to use the software, everything went smoothly, with no hint of malfunction. Learning to use the software was not particularly easy, however. (See the comments under Documentation.)

The CompuServe demo was useful in learning how to make a call and how to get around inside a data base, but we could find no meaningful areas of CompuServe that were open to us — all we could access were menus and instructions. Oh well, at least the price was right!



Ease of Use

Both the modem and the software were extremely easy to use, once we understood the software.

Error Handling

This product performed reliably in an error-free manner. It seemed insensitive to normal fluctuations in phone-line quality, and we were unable to find a line bad enough to cause it to fail.

Documentation

HesModem1's operation is described in a nicely printed 15-page booklet. There are five pages of excellent step-by-step instructions for loading the software and for connecting the computer, modem and telephone.

There are 10 pages describing the

terminal software package and its operation. They don't describe it very simply, and we think that few readers will be able to understand the instructions well enough to make the software work. Like too many instruction books, this one is mostly useful to those already "in the know" and is foreign and frustrating to the rest of us. It contains lots of information on the Receive Buffer, for example, but nowhere does it explicitly say what the Receive Buffer is used for. Nor does it give step-by-step instructions for getting into data bases or bulletin boards, or for making the terminal software compatible with the bulletin board's protocol. This is all the more unfortunate, because the software is powerful and easy to use. And with the CompuServe demo package, you have the perfect vehicle for a step-by-step description.

Compatibility

The HesModem1 is compatible with both Commodore computers and with all telephones having standard modular connectors on the handset.

Summary

This modem has all the features required by home computerists, and it comes with a powerful tape-based software package. The hardware documentation is excellent, but the software documentation is weak, especially if the user is a beginner. HesModem1 is a good buy for those who can get by without an excellent manual.

Louis F. Sander designs and markets electronics systems for hospitals and other health care specialists. He has authored over 100 computer-related articles.

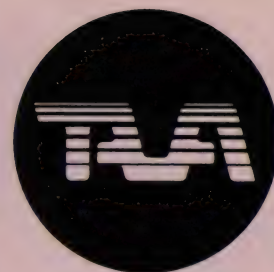
HESMODEM 1

FEATURES	10
INSTALLATION	10
SUPPORT	9
PERFORMANCE	10
EASE OF USE	10
ERROR HANDLING	10
DOCUMENTATION	5
COMPATIBILITY	10

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- Streaming Tape Primer (for hard disk backup)
- Touch Sensitive Screens*
- Bar Code Readers
- Graphic Interface Boards*
- Printer Primer
- Computer Work Stations
- P.S. (Peripheral Software)

November issue (on sale September 23rd)

- The PC That Jack Built
- Time Sharing Services
- Bar Code Use
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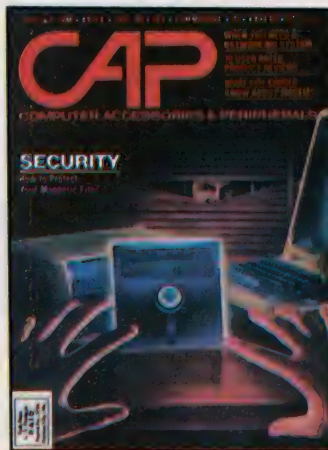




Photo by Mike Kirkpatrick

HAROLD LEE

By Hartley G. Lesser

MICROPROCESSOR PIONEER AND INDUSTRY MOVER

"One good way to look at our (computer) industry is that, literally, within the last three hundred years, we've harnessed lightning and used it to teach sand how to think."

— Harold Lee

Success need not be fleeting. Nor should the businessworld quake and quiver every time a self-proclaimed guru announces the death knell for a segment of the computing industry. Honesty and hard work are still essential for success — as in Harold Lee's case.

Harold Lee is heavily involved in integrated circuit design and microprocessor production. As both a consultant and an engineer, he is highly regarded as an expert throughout the computing industry. As President of M.O.S. Sorcery in Los Gatos, CA, Lee may be found building controllers for state-of-the-art robot arms most any day, or perhaps completing work on a new controller box for computerguided piano lessons.

From a workshop adjacent to his garage, Lee's ideas and schematics emerge. All design work is accomplished on an Apple II+ computer. An Axlon RAMdisk is the storage device of choice, perhaps also due to the fact that Lee invented this particular drive.

An adjoining work area reveals a drafting table and microprocessor schematics that can only be described as works of art. More amazing is the fact that these schematics were designed, drawn and printed through Apple II control. The largest of the schematics, a "D" size, contained 5,160,960 pixels and required storage on six 5¼" floppy disks.

"Even today, the Apple II is the best development tool available for the 6502," he said. The 6502 refers to the Central Processing Unit (CPU), the brains of the Apple computer. As schematic drawing became too complex and too arduous a task for him, computer assistance was needed. "The problem with schematics is that before any layout is completed, there may be several changes made. This requires altering the hand-drawn schematics each time."

Continued on Page 70



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Circle No. 111

Solutions for '84 AND BEYOND

Aircraft photo courtesy of Squadron Signal Publications from "F-15 in Action"

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HAROLD LEE

Continued from Page 69

So, Lee wrote a software-based Computer Aided Design (CAD) program to permanently eliminate this problem. Once the program is loaded into the Apple II's memory, the on-screen cursor may be moved to any picture being worked on. Transistors, capacitors and any design object can be moved and positioned at will. The product can then be printed by an Epson MX-100 printer.

A Gift To CAP Readers

Harold Lee is offering his CAD program to CAP readers at no charge. He requires interested readers to send a blank disk and adequate return postage. He'll duplicate the program and return the disk. "I would just like to make certain that those requesting this CAD program really intend on using it," he said.

Lee's design program is extremely simple to use and produces designs worthy of framing. The ability to produce complete schematics on an Epson



is marvelous. The program's graphics routines are written in machine code, with the user-interface written in Apple-soft Basic. Any Apple II or IIe with a RAMdisk should run his program.

This is a CAD program any engineer or graphics-oriented user would find useful. The action is fast and smooth. For non-Epson printers the user will have to write his own software.

Looking Back

Lee acquired an Electrical Engineering degree from the University of Idaho in

1967. His stay in famous potato country wasn't to last long, however. General Dynamics in San Diego needed bright, young engineers for their Atlas missile project. Not only was Lee involved in the design of these 20' diameter monsters, but also in their production. "The assembly lines held as many as 50 missiles in various stages of construction at one time," he said.

In 1968 he moved on to Stromberg Datagraphix, a subsidiary of General Dynamics — leaving missiles for cathode ray tubes (CRT). The CRT was

Continued on Page 72

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HAROLD LEE

Continued from Page 70

the typical output device for the computers of the late '60s.

The transfer of electricity into light is demonstrated by the CRT. First, the cathode ray tube is completely evacuated of air and a vacuum formed. Then, a beam of electrons is shot through the tube to strike phosphor. This causes the phosphor to glow.

One such product Lee was involved with was called the Charictron tube. In the Charictron tube, the electron beam was shined through a little matrix of copper that had every character of the alphabet electronically stencilled onto it. The electron would then take the shape of the selected character. The remaining characters were masked off from being displayed by another matrix at the opposite end of the gun. At that time, this was the best way of obtaining real-time character output.

More Inventions

Lee aided in the development of one such system that outputted directly to microfilm. The user could print 40 pages of microfilm per second, with pages consisting of 80 columns by 66 lines. The cost was about \$500,000.

He invented another tube while with Stromberg, one which provided 100 times the previously achieved brightness with an image projection onto a wall display measuring 10' wide by 10' high. Unfortunately, a recession hit the industry and the finished product was never marketed.

At Stromberg, Lee got his hands on a PDP-7, one of the older minicomputers that was popular in the late '60s. The main storage technology was core memory. A magnetic ferrite core, known as a torroid, could be strung on wires to produce memory organization. This was nonvolatile memory but required a great deal of space.

The Valley Calls

A job offer from Standard Micro Systems drew Lee north. The company was working on something known as Metal Oxide Semiconductor technology, or MOS. Each letter of the mnemonic stands for one of the three layers of materials used in the production of Large Scale Integration (LSI) micro-



Harold Lee with his inventions.

processors. This pioneering work was based on the Japanese transistor that inundated the U.S. in the late '50s.

"The transistor was an enormous advance. But we invented the N(egative) channel around 1972, which runs about 10 times faster than the then-standard P(ositive) channel," Lee said.

Silicon, the material from which processors are built, is a lattice structure. It is crystalline in nature with four electrons. Lee and the other engineers found that by negatively charging the silicon, a negative gate was created by placing an aluminum conduit between the uppermost positive sumps. The advance became the 6502 microprocessor, the heart of the Apple II computer. One of Lee's fellow workers was Jay Minor, who went on to found Synertek, chip manufacturers in Cupertino, CA.

The Toy That Made Millions

One afternoon while lunching in Sunnyside, Lee and Minor saw something in the corner of the bar that attracted their attention. This "something" was none other than the original *Pong* arcade

game, invented by Al Alcorn. Lee and Minor spent the remainder of their day playing *Pong*.

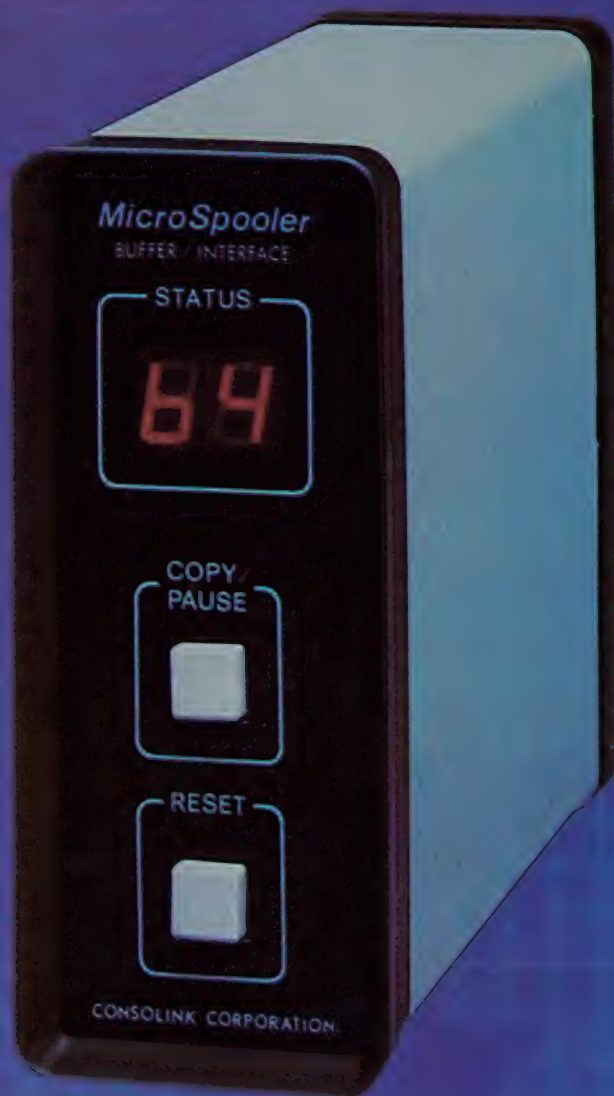
"*Pong* was the first real-time interaction between a computer and a video screen. To say we were fascinated is an understatement," said Lee. "That *Pong* game provided the open door to the current generation of computing."

Apparently, the reason for the computing boom came after Al Alcorn received a telephone call from the bar's owner. After just a short period of time, he complained, the installed *Pong* game wouldn't function any more. Al agreed to come and take a look at the kaput machine. When he opened up the game, however, the problem was immediately apparent — money had overflowed from the coin collection box and shorted out the printed circuit (PC) board. This was evidence that a profit could be made in producing arcade games.

The Atari Connection

Atari was subsequently formed. After designing a total of 12 chips at Stan-

Continued on Page 87



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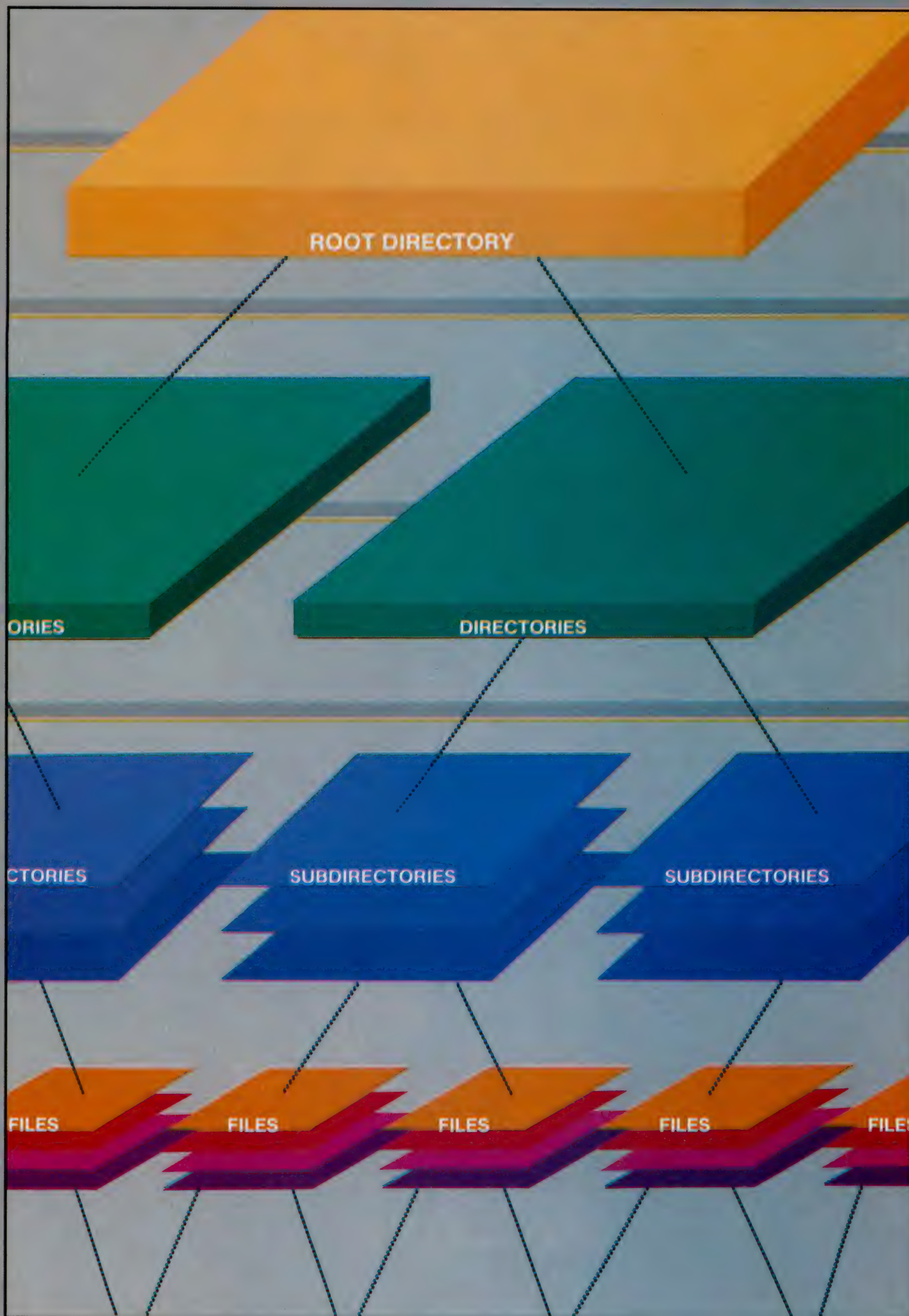


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EMERGING BUSINESS TOOL



Unix has been touted as the wave of the future in the computer world. Article after article and book after book have told us that this powerful, portable operating system will be the foundation for the next generation of business microcomputer software.

However, some new products are like waves: they are visible offshore for a long time before they wash over the beach. If you go into your local software store today and ask to see business programs that run under Unix, you might be met with a blank stare.

But there is Unix business software out there, and the standard is generally high. Right now, the majority of the market is probably in the hands of original equipment manufacturers (OEMs), systems houses and consultants. There is relatively little Unix software now sold directly to the end-user.

That situation is changing rapidly, however. Over the next year, a lot more Unix software will be announced, and what becomes available will be more heavily promoted. At present, Unix software is making the transition from a market inhabited and patronized by specialists to a mass-market product.

USING UNIX

Most Unix software will probably never be a mass-market item in the way that MSDOS software is. Unix is a complex operating system designed to support multiple users on powerful computers. Software for those kinds of machines has always been more expensive and taken more specialized knowledge than packages for single-user computers.

For example, the accounting packages tend to be oriented toward large organizations and more complex applications. You are less likely to find something for home use or a one- or two-man business with Unix.

UNIX UNITY

This situation naturally favors the systems houses. So does the nature of the "Unix community." Unix users, programmers, consultants and software houses tend to be a tight-knit group that interact largely among themselves. Indeed, one of the problems novices face learning Unix on their own is the unspoken assumption in the Unix documentation that there will be an experienced Unix user available to consult on the finer points. Unix software, particularly applications software, tends to be advertised in Unix-oriented publications or through exhibits at Unix trade shows.

By Rick Cook

UNIX

Or, as Dr. Gary Regula, the president of Applied Technology Ventures (ATV), put it: "There aren't any software stores that specialize in Unix." Regula said that his Cleveland, OH, company sells its UniWord word processing package primarily to computer manufacturers or OEMs. ATV will

customize the product for a manufacturer and a number of them sell it under their own names. "Typically you find people trying to sell a total solution rather than just a single software package in this market," he said.

Although it isn't a major part of their business, ATV does sell UniWord to consumers. The price of the package is between \$495 and \$1,495 depending on the processor it is to run on.

Another reason for the apparent scarcity of Unix business applications is that the Unix market is, relatively speaking, a new one. The Unix operating system itself is less than 15 years old and has only been marketed for about a decade. It wasn't until 1978 that the first commercial Unix license was issued. It has only been in the last year or so that ATV has been able to put its full weight behind the product.

However, one of the advantages of Unix is portability — both of the operating system and the applications packages. Once a program is running on Unix, particularly if it is written in the C programming language, it is a simple matter to move it to any other Unix system. Roland said many of the Unix packages appearing now were originally written for DEC minicomputers, which were the most popular Unix systems until the super-micros arrived.

As part of its support efforts, AT&T has reached an agreement with Digital Research to develop a library of applications that run under Unix System V, the current AT&T release. When the program was announced this February, AT&T claimed there were more than 700 applications packages available.

That doesn't sound like a lot of applications when compared to CP/M with an estimated 10,000 programs available, or Tandy/Radio Shack's TRS DOS that has more than 5,000. But there is more to software availability than mere numbers.

For one thing, not all those applications for CP/M or Tandy machines are very good. There isn't nearly as much unusable Unix software, especially not business applications.

"Virtually all the markets are covered," said Roland. "The coverage is actually quite good, although the absolute numbers of programs are not that large. There is something for almost everybody and what there is is pretty good."

Getting Help

Fine, but how do you find out what's available, and if it meets your needs?

Companies like Yates Ventures, a market research firm specializing in Unix, releases directories of available Unix software. Digital Research, in its

What do you get when you cross 1200 baud, free on-line time, and extra features at a price Hayes can't match?

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Yes. The MultiModem gives you features the Hayes Smartmodem 1200™ can't match. Features like dial-tone and busy-signal detection for more accurate dialing and redialing. Like a battery-backed memory for six phone numbers. All at a retail price of just \$549 — compared to \$699 for the Smartmodem.

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joint venture with AT&T, will be testing, listing and packaging Unix applications for a variety of fields. And, undoubtedly, there will be more to come.

Still, the market for Unix business software is young. As more microcomputers are sold with Unix, it will undoubtedly grow. As it grows, the focus may well shift toward sales of individual programs instead of turnkey systems.

"We have seen a lot of activity in the Unix market in the systems integrator end of things," said Laura King, vice president of marketing communications and product planning for Relational Database Systems Inc. (Palo Alto, CA). "Now with some of the announcements we have been hearing about lower cost business boxes, marketing to the actual user is on the upswing.

"We've been in the Unix market for four years. We used to only talk to systems integrators, but now we do a lot of business with Fortune 1000 companies, banks and companies using Unix internally."

The questions her company gets from users of its Informix relational data base management system reflect this change, King said. Instead of programmers who want to know the fine points of how Informix will react with the C function they are writing, the questioners increasingly tend to be managers or businessmen who are trying to produce a report with the system.

As a result of the shifting market, King said, her company has released a companion product to its Informix relational data base management system. The new product is called Personal Informix and it is designed for managerial-type applications. "It is designed to be a simpler version of Informix — scaled down, interactive and with lots of embedded help commands," said King. "It makes everything very obvious to you.

"It's for the business person who doesn't want this massive, wonderful but complex data base management system. The business user wants something simple that prompts them through daily activities."

With a product like Personal Informix, King said, there is no reason why a user can't purchase it in a software store, just like MSDOS software. King

predicted that it will take another six months to a year before Unix products start showing up in force on software retailers' shelves.

One thing that has got to happen first is that there have to be more Unix machines sold directly to the general public. Almost all of the microcomputers using Unix today are aimed at the multi-user business market — a market that is traditionally the province of systems houses and other third-party integrators. For instance, as

"IT'S FOR THE BUSINESS PERSON WHO DOESN'T WANT THIS MASSIVE, WONDERFUL BUT COMPLEX DATA BASE MANAGEMENT SYSTEM."

Weiner pointed out, there are no computers running Unix System V currently being sold to end-users. Until machines sold through conventional retail channels start to appear, he said, it doesn't make sense to talk about selling Unix software at the retail level.

Of course moving from an OEM/systems house market to selling more to end-users poses strains on companies beyond just making the software available. Selling to end-users requires more than just word of mouth. It takes heavy, expensive advertising and promotional campaigns.

"In the past, the Unix market has not been an extremely noisy market," King said. "I think now we're faced with the

same issues that MSDOS software companies have been faced with. Any time you go through retail-type outlets, it costs more money."

If you want Unix, but just have to have a particular CP/M or MSDOS package, you may be able to get the best of both worlds. A number of companies are preparing to market emulator packages — programs that will let Unix systems run applications written for those other operating systems. Roland said there are CP/M emulators on the market now and MS DOS emulators on the way.

An increasing amount of software can be moved directly to Unix by the manufacturers. ATV, for instance, is offering a Microsoft-compatible Basic compiler for Unix to OEMs. Programs written in Microsoft compiler Basic can be moved to Unix systems with a simple recompilation.

More and more applications software is being written in C programming language. Software houses are doing this to make the software easy to move to other computers. Most software in C can be translated over to a Unix system very quickly with only a small investment in programming time. That speed of transfer will encourage software houses with applications in C to make the transfer as the Unix market grows.

Generally, prices on Unix software are higher than the prices for single-user programs. However, since Unix systems are almost always multi-user, the prices include multi-user licenses. The price of a Unix application is usually less than two or three times the cost of two or three equivalent single-user packages. On a cost-per-user basis, Unix software is generally highly competitive.

However, don't expect to see Unix software marked down heavily the way MSDOS and CP/M software often is. As Roland points out, Unix software takes more handholding on the dealer's part, and that level of involvement has to be paid for somehow. **CAP**

Rick Cook is the owner of Fractal Systems Group, a firm that specializes in end-user documentation writing, located in Phoenix, AZ.

Introducing the Smart Terminal With a Dumb Price



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Now, there's an exciting new attraction in smart terminals. The "Challenger" family of ergonomically-designed Soroc terminals is the result of an innovative commitment to flexible performance and professional user comfort. These features combine to establish a new standard for price/performance comparisons and the ultimate in operator convenience and productivity.

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*National Institute for Occupational Safety
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NEW PRODUCTS & UPDATE

Note: The following product announcements are supplied directly by the product manufacturers. The CAP Magazine editorial staff assumes no responsibility for the claims made in such announcements, nor is the information based on staff evaluations.

Macintosh Optimization

The Apple Macintosh may now take advantage of the capabilities of Applied Creative Technology's Printer Optimizer. With memory configurations of 64 K to 256 K, this means that the Macintosh owner will be able to keep using his computer while his printer is printing. Additionally, up to 3 printers can be connected and they can be a mix of both RS 232C serial and parallel. The Apple Imagewriter printer has a third, print-quality mode added to its capabilities when used with MacWrite, and the printer may also be adapted to other computers through Printer Optimizer connection. Retail price is \$598.

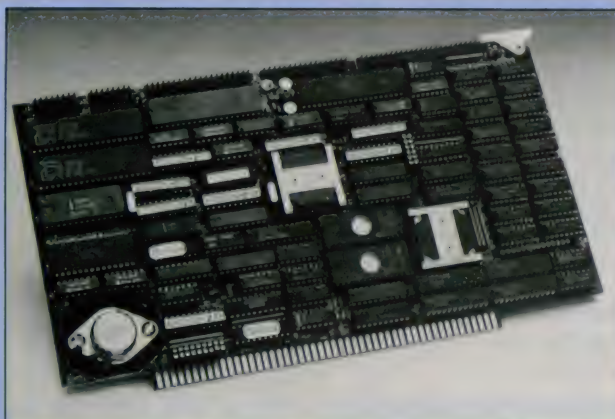
Applied Creative Technology, Inc.
Circle No. 128

10 Pen Plotter

The FP 5301 is a B/A3 size 10 pen plotter which can be used for CAD, engineering and business graphics applications. It will replace the Western Graphtec WX 4630 series, which was a family of lower speed 1, 2 and 10 pen plotters. The FP 5301 has increased speed, 17.7" ips axially and 25" diagonally.

A self-capping pen is a new feature of the FP 5301. Also, a variety of pen types are available — ball-point, fiber-tip, ink drafting pens and pencil. A built-in pen sensor automatically detects the type of pen and optimizes the plotting speed and pressure.

The FP 5301 can interface with any type of computer as it is available with any one of three standard interfaces: RS-232C, GPIB/IEEE-488 or 8 bit parallel. All types of media, including film, also can be used with this unit. A hidden, flip-down keyboard and a pen storage area give the FP 5301 a practical, compact appearance.



Super S-100

The first 16-bit S-100 single board computer built around the Intel 80186 chip has been introduced by Advanced Digital Corporation. Called the SUPER 186, this board is ideal as a 16-bit master, to enhance the performance of Advanced Digital's SUPER SLAVE processor boards, or as an 8-bit slave card, to process large work loads at an increased speed. SUPER 186

features 256 K of memory which is expandable to 1 MB and a floppy disk drive controller that can support both 8" and 5¼" disk drives simultaneously. The board comes with four RS232C and two parallel ports and supports CP/M-86, MP/M-86, TurboDOS and MSDOS operating systems. Retail price is \$1650.

Advanced Digital Corp.
Circle No. 340

This new unit boasts increased programmable function commands, which total 47. The single character Graphtec Protocol Graphics Language/GPGL command, as well as the HP/GL compatibility, combine to make this an extremely versatile plotter.

The plotter will be sold directly to the OEM market and through Western Graphtec's established manufacturer's reorganization to the end user market. The price will be approximately \$3,000.

Western Graphtec Inc.
Circle No. 332

Double Duty

In addition to near letter-quality printing, the Seikosha GP-550A is an extra high quality printer

that offers standard dot matrix printing. Graphics and text capability are both wrapped into one easy-to-use printer with speeds of 50 cps in data processing mode and 25 cps in near letter quality mode. The printer is ideal for a variety of applications in data processing, graphics and documentation. Excellent cost performance and the printer has a lower noise level than most in its class.

Axiom Corp.
Circle No. 146

Computer "Wear"

Tired of wearing alligators, horses and the like on your chest? A line of wearables with the pet chip emblem is being distributed by Target Market Lists of Winston Salem, NC.

Tee shirts, velour pullover sweaters and jogging suits in a multitude of colors will soon appear in college bookstores and gift shops in airports, hospitals and motels. Prices for the tee shirt range from \$8.95 to \$12, for the sweater \$35, and for the jogging suit \$49.95. If you can't find them locally and want to get a chip on your shoulder, contact: Vision Graphics, Box 740521, Dallas, TX 75374-0521.

Vision Graphics
Circle No. 372

Crafted Copy Protection

Media Systems Technology, long a leader in diskette duplication, has announced a new copy protection program for IBM PC and XT software called Flex-Lock that was developed in conjunction with Softguard Systems of San Jose, CA. Customers need make no adaptations to their programs, as this protection scheme works around the software, takes up minimal space on the disk, and has almost no impact on the end-user. The product also enables the controlled distribution of software and allows customers to specify the number of backup copies to be made.

Media Systems Technology, Inc.
Circle No. 216

Spike Suppression

Two new Transient Voltage Surge Suppressors (TVSS), the EMF-2 and EMF-3, are now available from Philips ECG, Inc. These products clamp transient surges to a safe level under 400 volts without impeding normal current flow or increasing energy costs. A built-in overload feature removes AC power from the equipment in use.

Philips ECG, Inc.
Circle No. 163

NEW PRODUCTS & UPDATE



Feeding Your Qume

The Paper Matic 100 single-bin sheet feeder has now been designed to fit the Qume Sprint series of daisywheel printers. This product features a patent pending mechanical feed mechanism which helps prevent paper jams, misaligned sheet insertion and incorrect paper feed. The feeder attaches quickly without the need for tools, and a technical support hotline is also provided.

LQ Corp.

Circle No. 380

A Better Bundle

The purchase of a Roland DXY-800 8-pen plotter or a DXY-101 single-pen plotter now includes free software. Keychart is an easy-to-use menu-driven business graphics package which affords the user the ability to create full-color professional graphics with an IBM PC. The plotters feature both serial and parallel interface, 16 different print sizes, 11" x 17" flat bed and 8 K of on-board memory to help simplify commands.

Roland DG

Circle No. 331

Secure Computer

Technalock from Business Security Systems deters the theft of personal computers by locking your computer to your workstation. No tools are required, as an acrylic, pressure-sensitive adhesive attaches the locking table to computer, monitor and table top. \$24.95 for the complete system.

Business Security Systems

Circle No. 220

Clean Computer Air

Consolaire utilizes a combination of the best features of air filter and ionization technology. The product removes airborne particles down to an incredible 0.01 microns, with 2 silent fans providing for 6 levels of speed adjustment. Air is filtered at the rate of 12,000 cubic feet per hour. Use of Consolaire increases worker productivity and lengthens the mean time between failures of such components as disk drives and their read/write heads. Retail price is \$169.96.

New Bios

Circle No. 383



Commodore Color

A new composite monitor released by Sakata features excellent sound, exceptional linearity and low distortion. The Model SC-100 is a 13" CRT with a resolution of 280 lines (horizontal) and 300 lines (vertical), a display format of 1000 characters, and retails for \$329.

Sakata

Circle No. 192

Sharing

The ThinkLink System, a micro area network which provides high-speed, cost-effective data and resource sharing to a multi-personal computer environment, has been released by Tangent Technologies. The ThinkLink can connect IBM PCs together, Apple Macintosh personal computers and many other brands. As many as 4 printers and 4-24 interconnected computers can be managed by this product. Included in the TL-Cluster Server is a 20 MB hard disk

subsystem with an associated 20 MB cartridge tape backup unit. Also, 3 RS232C and one Centronix-compatible parallel port are included to support shared printers.

Tangent Technologies

Circle No. 269

Alarming Product

A pressure-sensitive mat and a control module are all that are needed to sound an audible alarm should an unauthorized individual try to remove your computer system while protected by Data Defender. The system operates on the principle of pressure-sensitive switches that blast an alarm if the computer is lifted from the mat. One control module can also protect groups of computers. Data Defender retails for less than \$200.

PICOtronics, Inc.

Circle No. 217

Half-Sized Color

Half the size of the IBM Graphics Monitor/Adapter Card, the new Hercules Color Card can be inserted into one of the IBM XT's short expansion slots. This leaves the longer slots free for full-sized boards. The Hercules Color Card is compatible with all color software for the IBM color card and also provides high-resolution graphics capabilities for the monochrome display. Additionally, a parallel printer port is located on the card.

Hercules Computer Technology

Circle No. 144

Less Cost

Houston Instrument has announced a price reduction for the CPS-19 four-pen plotter, an ideal product for high-volume, technical graphics applications. The CPS-19, now retailing for \$9,995, can access dozens of CAD software packages that are especially designed for microcomputers.

Houston Instrument

Circle No. 131

Computer ChainMail

Apple Armor protects Apple computer equipment from theft. This security cabinet with a flip-up cover allows the computer, one or two disk drives, fan, monitor, and the new Duo disk drive to be secured. The cabinet is made of steel and allows for easy computer servicing without moving the monitor or the security cabinet.

Omni Tech Corp.

Circle No. 245



Professional Flexibility

A versatile dot matrix printer, the Model 8010, has been released by Dataproducts Corp. This new printer can print words, numbers and graphics with high resolution and is compatible with most popular microcomputers. Draft correspondence is printed at 180 characters per second (cps), text at 110 cps and letter quality at 30 cps. Dot densities are increased and a more stylized and appealing image is printed. A wide variety of character sets is offered. Retail price is \$650.

Dataproducts Corp.

Circle No. 379

Communications Workstations

For those wishing to upgrade the capabilities of their single-function terminals into complete office systems, RCA introduces a new family of high-performance communications workstations. The Xenix operating system is supported and a large library of applications software can serve both local and remote networks using standard communications links.

RCA Corp.

Circle No. 180

NEW PRODUCTS & UPDATE

Software Training Products

American Training International, Inc. (ATI) has upgraded some of its leading training software for personal computers. Three programs have been enhanced through the addition of advanced training functions and a second diskette. These are interactive disk-based training programs for Lotus 1-2-3, Multimate and Multiplan, and for the IBM Personal Computer. The enhanced programs offer color graphics — a feature added last year — for users with color monitors. The price is \$75 per package.

American Training International
Circle No. 336

Portable Disk Drive

Briefcase computers now have the capacity to store information directly onto disk without using a desktop computer. Percom Portable Disk Drive is battery operated, weighs 3 lbs., has a large storage capacity and can be used with most briefcase computers. The hardware designed by Percom Data Company, along with Portable Computer Support Group's programming — called Percom Interface — eliminates the need for desktop or main-frame computers to transfer information onto disk. This major technological innovation moves the personal computer one step closer to becoming a complete office for business people on the move.

The Percom Portable Disk Drive is powered by a 12V rechargeable battery pack and connects to the computer's RS232C printer port that is available on most briefcase computers, making it virtually universal in concept. It retails for \$799.

Percom Data
Circle No. 337

Expand C-64 Memory

The unexpandable memory configuration of the Commodore 64 is no longer unexpandable! LETCO, the pioneer of the popular 64 K memory expander for the VIC 20, announces the adapter (Model 64KVA) to use with their 64KV memory expander on the Commodore 64. When used on the C-64, the addresses from \$8000 to \$9FFF will have 8 separate blocks of 8 K locations, each block selected by a single poke instruction. Current owners of the 64KV only need the adapter to use their memory on the C-64. The adapter (Model 64KVA) is priced at \$29.95. The memory (Model 64KV) for use on the VIC-20 is priced at \$109.95. The combination (Model 64KC) for use on the C-64 is priced at \$139.95. Complete instructions are included with each product.

Leader Electronic Technology Co.
Circle No. 338

Graphics Camera

Kiron Video Photo Recorder makes it easy for computer users to make slides or instant prints of their computer graphics for presentations, reports, files or general circulation without the time, expense, or loss of confidentiality that results by sending the information out of the office for processing. The Kiron Video Photo Recorder bridges the input signal of the computer monitor, displays the color signals on a self-contained 7" monitor with 525-line resolution, and exposes any one of a variety of film types to produce the photograph. Its controls allow for different settings to balance up to 32,769 colors with negligible line distortion. Even if the user doesn't have a color monitor, he can make color photographs of the displayed image within the limits of the software program.

The Kiron VPR can be used with the following films: Polaroid 600 Series, 500 Series (including Types 558, 559, 552); 35mm reversible films with ASA 60 to 400; Fuji Fotorama F110 Film; Kodak Kodamatic HS144-10 and Kodak Time Print films. The unit comes with the standard film back for the Polaroid SX-70 series film, but backs are available for the use of 35mm negative or slide films and Kodak instant films.

Currently the Kiron VPR is compatible with the Apple and IBM personal computer systems with use of compatible cables. The VPR may also be connected to a video tape recorder and used to make still photographs of images on a television screen. It retails for \$3,200.

Kiron Corp
Circle No. 339

Adjustable Mobile Equipment Stand

An adjustable mobile equipment stand with a locking lower cabinet has been designed for use with both projection and video equipment. The adjustable top shelf on the stand can be positioned in height ranges from 28" to 42". The unit is constructed all of steel, utilizing exclusive arc-welded caster sockets. The "E" model of the CA26-42 also provides an electrical assembly with two outlets, a 20', three-wire cord and a grounded plug as well as a built-in cord winder. Price is \$179; with assembly, \$202.

Bretford Manufacturing Inc.
Circle No. 340

Shielded Serial Printer Cables

Fully shielded printer cables feature an end-to-end shielded construction which ensures that the cables exceed the FCC EMI/RFI requirements on emission standards (Docket

#20780). The cable assemblies incorporate PDT technology, a unique under-hood method that insulates against any adverse environmental or mechanical conditions. Price range is \$18-\$35.

Alliance Research Corp.
Circle No. 341

Ergonomic Worktable

This table, called Hide-a-Way, adds ergonomics to your office by providing a pull-out copy bridge, properly angled to hold your reference data between the keyboard and screen. With a touch the copy holder pulls into place. Having the copy holder in front reduces operator fatigue by minimizing head, neck and eye movement, thus increasing productivity. When not in use simply push the copy holder back and it hides out of the way.

Width is 17½", depth is 14½"; place on disk drive or video shelf. Price is \$60.

HSP Computer Furniture
Circle No. 342

IBM PC and XT Network

PCnet II is designed to link IBM PCs and XTs running PCDOS 2.0 or 2.1. The networked PCs are designated as shared PCs, with sharable disk drives, or as user PCs, which can access shared PCs. User PCs can access up to 16 floppy, hard or RAM disk volumes. Print spooling allows queuing of print jobs on disk at 3 shared printers located anywhere on the network. System requirements are: one floppy disk drive, a minimum of 128 KB of memory and one expansion slot for the controller card. It retails for \$1,295 for the starter kit, and additional nodes cost \$595 each.

AST Research, Inc.
Circle No. 343

NEW PRODUCTS & UPDATE

Color Dazzle

A new multi-mode, color, dot matrix printer featuring a 24-wire printhead and "daisywheel emulation" provides for high-resolution printing at 130 characters per second (cps) for letter-quality and 180 cps for rough draft printing. Unique is the 1570's ability to convert daisywheel software codes into dot matrix codes. Both tractor and friction feed paper are provided for in this 33 lb., desktop-sized printer. Retail price is \$2,000.

C. Itoh Electronics, Inc.

Circle No. 130

Printer Pals

The ESI-2002 and ESI-2004 ShareSpool products allow up to three personal computers to share one printer. This device acts as an intelligent printer interface and automatically spools and manages the print output for as many as three computers. The ESI-2002 is equipped with 64 K of spooler memory standard and up to 128 K of optional memory and also offers a serial interface. The ESI-2004 offers parallel interface with the additional ability of accepting data from an RS232C-equipped personal computer and converts the output to parallel format. Retail cost is \$485.

Extended Systems

Circle No. 377

Hard Core Backup

With StorFile, streaming tape backup for your hard disk or any Winchester disk that operates with a PC or compatible is easily accomplished. StorFile consists of an on-board microprocessor that interprets high-level motion commands and allows the drive to support both streaming and file-oriented dump/restore modes. Each StorFile comes with its own power supply and records 10.4 MB of information on a tape cartridge.

Data Storage Solutions

Circle No. 385



Silent Speed

With a noise level of less than 55 db and the capability of printing eight pages a minute, Hewlett-Packard's new LaserJet printer also features 300-by-300 dots per inch of resolution. This personal printer possesses Courier 10 font, multiple typefaces, disposable printing car-

tridge, built-in sheet feeder and a standard RS232C interface. Screen-copy graphics compatibility with the HP 150 personal computer is already standard, with IBM PC screen-copy software available later this year. Retail price is \$3,495.

Hewlett Packard

Circle No. 129

Interface Cleanup

Gold Mist Jr. is an exclusive aerosol designed for precision cleaning and lubrication of all types of connectors used to interface a CPU with an external device, such as a printer or microcomputer. The use of this cleaner prevents galvanic corrosion and reduces frictional wear of connectors.

Texwipe Co.

Circle No. 303

Modular Environment

A totally modular furniture unit designed for the personal computer has been released by the R.C. Smith Company of Minneapolis. In addition to providing a functional work environment, the attractive style of the CompuStation blends into any office decor or home environment. A patented steel frame enclosed by a laminated oak desktop with rounded, solid oak edges makes up the workstation's main component. Additional components may be selected by the consumer to personalize the workstation.

R.C. Smith Co.

Circle No. 250

Oaken Comfort

A desk, hutch, printer stand, corner connector, monitor/printer platform and an optional lockable door module are offered in the Oak 170 Series of computer furniture from Bush Industries, Inc. The acrylic-coated laminated work surfaces have a warm, dark brown, non-glare finish. Several modules are available to complete the professional workstation.

Bush Industries, Inc.

Circle No. 246

Monochrome Graphics

MonoGraphPlus offers high-resolution and bit-mapped graphics capabilities for IBM monochrome displays. This graphics capability is in addition to an on-board clock/calendar with battery backup and a parallel printer port. Software included with the board allows for both RAM disk and printer spooling. This user-installable board is compatible with Lotus 1-2-3 and other popular programs and provides a flicker-free display.

AST Research, Inc.

Circle No. 149

Three's Company

Two or three Atari serial peripheral input/output connectors are featured with APE-Link, an expansion cable for Atari computers. Using APE-Link, different peripherals with only one serial port may be linked at the same time to any Atari personal computer. A 6' cable is standard. Retail price is \$39.95.

Digital Devices Corp.

Circle No. 227

Dynamite Disks

Extra-durable 10 mil polymer jackets with protective liners, aculene center hub rings, self-lubrication and a lifetime product warranty accompany the release of Datam Disks. Available in 5¼" size, these disks may be purchased in either single- or double-sided 10 Pacs with 48 and 96 TPI capability. Every disk is tested and certified 100% accurate at a 75% clipping test level — this is 87.5% above ANSI and NBS industry standards.

Datam Flexible Disks

Circle No. 300



Low-Cost Feeders

A new line of low-cost sheet feeders has been announced by Rutishauser, designed specifically for low-end impact and non-impact printers. The RS-33.0 allows only vertical paper insertion, while the RS-33.1 can handle horizontal as well as vertical formats. Each feeder weighs approximately 3 lbs, holds up to 80 sheets of paper and allows printing on every line of the paper. The retail price is about \$425.

Rutishauser of America

Circle No. 376

What Business Can Afford To Use Fuzzy Information?

in this age of information processing, perhaps the most important information processing occurs between your eyes and your monitor screen. An unclear on-screen image can visually distort the most accurate information, leaving valuable information lost somewhere between the lines.

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Roland DG makes a broad range of monitors, to suit any personal computer and to please any computer's person. From high resolution RGB and Composite Color monitors to Monochrome Composite or TTL signal (IBM-PC) in either Amber or Green.

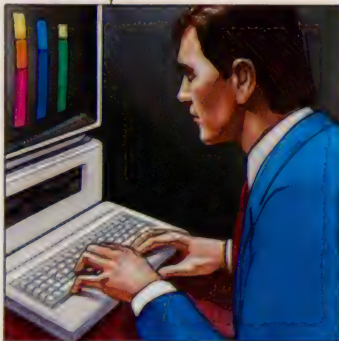
If accuracy is important to you, you shouldn't settle for anything less than a Roland DG monitor—the clear choice. Because the most important information processor is you.

Roland monitors are available at fine computer dealers everywhere. Roland Digital Group, 7200 Dominion Circle, Los Angeles, CA 90040 (213) 685-5141.

M O D E L
CC141

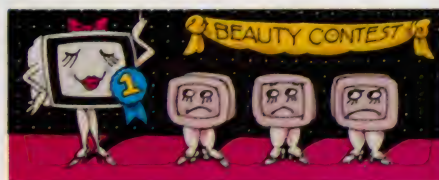


the most important information processing occurs between your monitor and your eyes.



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there's a Roland DG monitor for every computer's person!

Circle No. 122

Roland DG

NEW PRODUCTS & UPDATE

Protection Plus

An inexpensive method to prevent the unauthorized use and distribution of individual software applications has been released by Remote Systems, Inc. Secureware Jr. has been developed as a low-cost solution for the protection of an individual program. This product shares a serial or parallel communications port and will not interfere with the normal operation of any connected peripheral. It can also be used with hard disks and networks.

Remote Systems Inc.

Circle No. 219

Pirate Proof

The Key is a hardware module used in conjunction with software to protect the software from unauthorized use. The newly released High Security version of The Key for IBM PCs provides the computer with a unique identification, one of 24 quintillion unique inquiry/response pairs. The Key also protects software after it has been copied to a hard disk.

Staff Computer Technology Corp.

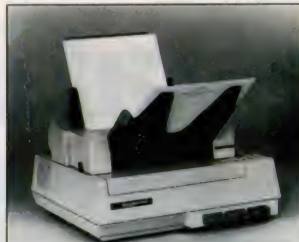
Circle No. 218

Graphics Greatness

A company that specializes in video and graphics products has released a new, high-resolution color graphics board for the IBM PC. With simple commands, the user can draw circles, ellipses, rectangles and many other objects. It can be used for business graphics, animation, video disk and tape production, overlaying graphics on video pictures, computer-aided instruction or design, and many other applications. The board has its own 32-bit processor and graphics circuitry, making it faster and more versatile than other boards. Introductory price is \$800.

IEV Corp.

Circle No. 150



Special Feeder

The Texas Instruments Model 855 printer now has a bin feeder option. The OMNI 800 bin feeder was designed especially for correspondence-intensive word processing applications. This product provides an advanced paper handling capability that allows the user to automatically feed up to 125 sheets of paper at one time. First in, first out collation is accomplished in the feeder's output bin. List price is \$499.

Texas Instruments

Circle No. 375

Rolltop Center

A unique rolltop enclosure retracts to reveal a highly functional, personal computer data center in the release of PC Data-Center from Hamilton Sorter. This unit has been designed to accommodate almost all major brands of personal computers and companion printers. The keyboard and disk drive are located on a suspension shelf which is pulled forward to the operating position. The work surface is used for source documents as well as a mouse-driven cursor control device. List price is \$500.

Hamilton Sorter Co., Inc.

Circle No. 247

Friendly Phone

The new Companion modem may be connected to the RS232C port of more than 100 personal computers. This modem features full duplex operation at 300 and 1200 bps and supports keyboard diagnostics, including

local analog loopback, local digital loopback and remote digital loopback test. The product is packaged with MITE Communications Software. Other features include adaptive dialing, DTMF tone or pulse, automatic answering, speed detection call progress monitoring and automatic storage and dialing of last phone number. Two RJ11C jacks are included for both voice and data communications.

CTS Corp.

Circle No. 374

Bet Your RGB

A prime supplier of gambling and lottery displays, RGB Display Corp. of Grass Valley, CA has announced the release of their RGB-1400PC computer display monitor. A special, high-potential focus CRT was designed for this monitor with over 700 lines of horizontal resolution and super-high contrast glass with a non-glare surface. Color sets are selectable and the product includes test signal performance verification. List price is \$595.

RGB Display Corp.

Circle No. 189

New Network

The Percom Net-Interface card for the IBM PC is now available and is the first announced local area network (lan) designed around the new Western Digital WD2840 Network Control Processor. The host microcomputer will not be burdened with unnecessary tasks and excessive use of memory. The network interface simply plugs into the host computer and is then linked to the network through the unique Percom Data cable interface. Many features are included, such as token passing reliability and support for simultaneous voice/data transmissions. Package price is \$1,695.

Percom Data Corp.

Circle No. 371

Bar Code Reader

E-Z-Reader can read, decode and transmit Code 3 of 9 and Interleaved 2 of 5 and connects to virtually any RS232C configured computer. This product has a high first-read rate and also reads dot matrix as well as printed bar code labels, issues an audio signal to indicate a correct read, and has switch-selectable terminator characters. Retail price is \$495.

Peripheral Connections

Circle No. 226

Printer Pool

Two, three or five computers may now share a single printer, thanks to "PC" Switches. This interface switching unit for the IBM PC can also direct one computer's output to two, three or five peripherals. All connections are made from a single port on the computer.

General Interface Systems, Inc.

Circle No. 374



Free Time

Additional intelligent features have been added to the new MultiModem, a 1200/300 bps modem from Multi-Tech Systems. The modem has the same command set and functions of the Hayes Smartmodem 1200, plus it can store up to six 31-digit telephone numbers in its battery-backed memory. MultiModem can detect dial and busy tones and can continuously redial a busy telephone number until connection is accomplished. Free on-line time to CompuServe and NewsNet is included with purchase. Retail price is \$549.

Multi-Tech Systems, Inc.

Circle No. 373

HAROLD LEE

Continued from Page 72

dard Micro Devices, Lee joined Atari, which was operating out of Los Gatos, CA, with a total of about 100 employees. One other employee was destined for notoriety, a technician in Atari's lab by the name of Steve Jobs.

As both a production and design engineer, Lee began work on the arcade coin collection boxes. He solved the coin overflow problem and was influential in the design and release of the first arcade *Pong* game. He also assisted in the creation of the first racing car game. "A local auto parts wholesaler sold to Atari steering wheels and Hearst linkage, which we then bolted onto the arcade game," he said.

The pressure from his job took its toll, and Lee left in the fall of 1974. He bought a Christmas tree farm and lived in a cabin. He also started his company, M.O.S. Sorcery.

At the recommendation of Steve Jobs, Atari asked Lee to work on a project for them ... to place the entire

Pong game onto a single chip. From November, 1974 to the chip's production in 1975, Lee engineered the first digital home arcade game and doubled Atari's income overnight. He brought Jay Minor into the project, who actually designed the MOS for the VCS market as well as three custom chips for the original Atari 800 home computer. He followed this coup by creating and designing the first game for what is now known as the Atari VCS machine.

These LSI products were so successful that Harold was asked to assemble a team to manage these video interface chips for Atari. The last silicon chip Lee designed was a slot machine game that would sell for \$30. However, Warner Communications, who was about to purchase Atari, had a "no gambling" machine clause in their contract and the project was dropped.

From there Lee started freelancing and building controllers around the 6502 microprocessor. He bought a KIM computer and began to penetrate into the food processing industry. He

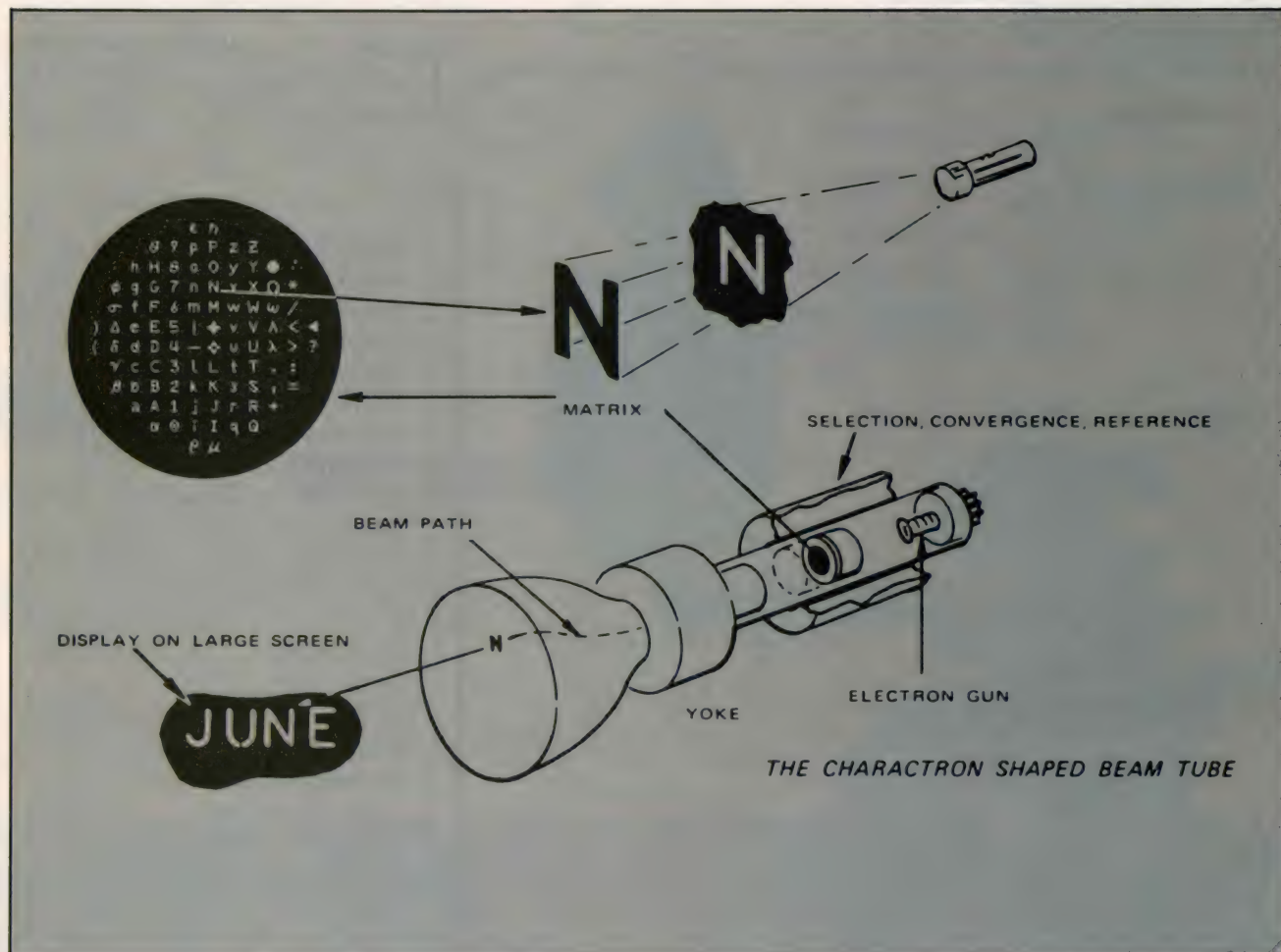
tackled a problem for Pepsi-Cola to develop a method to check their recycled bottles for fatigue. The bottles would break on the filling line, which caused a terrible mess and halted the line for cleanup. Or worse, the bottle broke in the consumers' hands. Lee designed a fatigue tester with a 6502 CPU and measured bottle pressure and bottle cap stress. The end result proved successful, and the integrity of Pepsi was added to his list of accomplishments.

The Apple Emerges

"Then, all of a sudden, on the scene appeared this personal computer called the Apple. And what a surprise it was to find out that my old friend Steve Jobs had something to do with it," he said. "I saw my first Apple at Al Alcorn's house. The serial number was 48. By the time I managed to get my copy, the serial number was 4000. And when I bought it, I wasn't sure what it could do."

Lee's first project with the Apple was the development of a product

Continued on Page 88



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HAROLD LEE

known as Piano Master, which will be marketed in late 1984. This control box regulates lights atop piano keys and is an aid in the instruction of piano playing techniques and in the memorization of musical scores. He continued to work in the food processing industry and began working with hydraulic controls.

Another past success is the RAM-disk currently marketed by Axlon. Lee remembers buying 64 K chips at \$15 each and designed both a 320 K and 128 K RAMdisk. No user memory is depleted and there was battery back-up for the drive. Lee claims that once you've used a RAMdisk, there's no returning to a floppy disk system. Access is extremely fast and the product allows designers and programmers instant code availability.

His current, and nearly completed, project is a robot arm that manages acid dips for silicon boats. Two 6502 microprocessors control this robot. The arm's position is updated every 2 milliseconds. There is approximately 16 K worth of trigonometry tables in the second 6502 chip, with over 32,000 angles recorded.

Final Thoughts

Where Harold Lee will go from here is anyone's guess. He is successful but manages to maintain a low profile. Due to Lee's efforts, our businesses can function with far more efficiency than many may have dreamed possible as little as a decade ago.

His offer of an Apple II or IIe compatible CAD system at no cost to the user is extraordinary. This is no fly-by-night program. The system has been in use for quite some period of time by Lee, with the results turned into profitable, viable products.

The address to send your blank 5¼" floppy disk and a mailer with the necessary return postage affixed is:

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Taxan

RGB III	446
RGB 420	534

PGS

PGS HX12	473
MAX 12	196
SR 12	Call

USI

Pi 2 12" Green	125
Pi 3 12" Amber	142

Sanyo

8112 Hi/Res	195
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NEC

JB 1201	162
JB 1205A	172
JC 1410	817

MODEMS

Hayes

300	207
1200	493
1200B	432
Micromodem IIe W/T	242

US Robotics

Password	307
Autodial 212A	460

Novation

Access 1,2,3	454
Apple Cat II	277

Prometheus Products

Promodem 1200	365
Options Processor	78
Memory	\$30 per 16K up to 64K
Alphanumeric Display	78
Procom Software-Apple, IBM	78

Rixon

PC212A	415
P212A	415

IBM ACCESSORIES

Ast Research

6-Pack	225
Combo Plus	225
Mega Plus	225
64 K Ram Set	55

Plantronics

Color Plus	375
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Hercules Computer

Hercules Graphics Card	350
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Amdek

MAI	477
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Koala

Koala Graphic Tablet	Call
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Everex

Dual Display	Call
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Number 9

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PRINTERS

C. Itoh

Prowriter 8510P	120 cps	340
Prowriter 8510SP	180 cps	477
Prowriter 8510SPC	180 cps color	552
Prowriter 1550P	120 cps	552
Prowriter 1550SP	180 cps	685
Prowriter 1550SPC	180 cps color	777
New CX4800 plotter		518
New A10 18 cps Daisy Wheel		510
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93p	160 cps	705
IBM Printer Rom		45
2350	350 cps	2000
2410		2380

Star Micronics

Gemini 10X	120 cps	285
Gemini 15X	120 cps	423
Delta 10	160 cps	448
Delta 15	160 cps	633

NEC

3550	40 cps	1698
7710	55 cps	1899

Brother

HR1	16 cps	569
HR25	23 cps	765
HR35	34 cps	935

Dynax

DX15	14 cps	477
Keyboard		149

IDS

Prism 132 color		1535
Prism 80 color		1419

Transtar

315 color		450
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Silver Reed

550		595
500		431

Juki

6100	18 cps	450
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Teletex

1014	12 cps	455
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Mansman Tally

Spirit	80 cps	315
160	160 cps	641

DISK DRIVES

For IBM

Tandon TM100-2	180
Teac 55B 1/2 Height	175
Pan/Shug 1/2 Height	165
CDC	220

For Apple

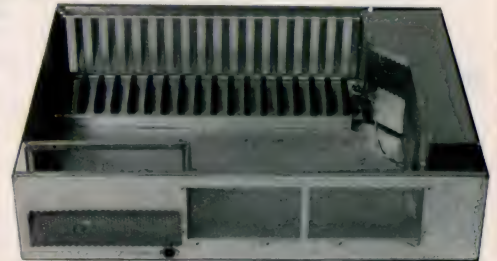
Super 5 1/2 Height	203
Quentin Ap 100-Y	242
Quentin Ap 105-Y 1/2 Height	213
Quentin Controller	48
Rana 1	255
Rana 1 with Controller	325

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Scion	1595	Call
Halo-Intlght High Res Graphics	150	Call
PROTIUM	1195	Call
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Keytronics Keyboard DVORAK	169	Call
Keytronics Keyboard 5151	255	Call
Lotus 1-2-3 users, you need this keyboard.		Call

COMPUTERS

Franklin OMS 1200	1709
Columbia 1600-1	2600
TAVA PC	1900
Eagle I	1650
Eagle II	2050
Eagle III	2270
Eagle IV	3500
Eagle PC-2	2730
Eagle 1620	3400
Eagle 1630	5270
Eagle 1640	6400

TERMINALS

Televideo

914	563
925	717
950	914

Wyse

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Teletex

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Spellstar	131
Pro Pack	475

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Realworld AR	533

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Micro Stuff

Crosstalk	134
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Micro Rim

RBase	344
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EDITORS' CHOICE

Continued from Page 20

Support

Home Base extends a one-year warranty on their products. A telephone call to the manufacturer provided a correct answer to my construction problem. The phone was answered promptly and politely, with the call forwarded to Mr. Jean-Pierre Cayer, President of Home Base, who took the time to personally handle the query. However, there is no toll-free number, and the company is located in the Province of Ontario, Canada.

Performance

Both an Apple computer system and an IBM PC were tested with this Home Base Combination. The Apple and the IBM plus a green phosphorous screen monitor fit nicely on the Basic Cube.

The keyboard extension did not function with the Apple, as this computer is one continuous unit, unlike the IBM PC. A dot matrix printer and a letter-quality printer both fit comfortably on the Cupboard module. In the case of the latter printer, a rather cumbersome and old daisy wheel whose movement recalled the San Francisco earthquake, the module handled the vibrations with ease. Nothing fell apart. The shelves were used for software and book storage, with a stereo unit placed atop both of the Hutches. The printers could not manage, despite their best efforts, to displace any of these items during operation.

Ease of Use

After assembly, the units presented no problems whatsoever for either positioning or use of the computer equipment and accessories.

Documentation

The assembly instructions for each unit were concise and accurate. The Hutch and Basic Cube instruction sheets consisted of four operations, while the Cupboard documentation required nine specific assemblies. All documentation was illustrated and all parts and tool requirements well indicated.

Compatibility

The only system that might have problems using the Home Base Basic Cube module would be one that has an extension monitor, such as the DEC Rainbow. A standard, non-mobile monitor that sits atop a computer base unit should fit with ease. However, trying to use more than one monitor per cube would prove difficult. As a standard monochrome monitor would be required for word processing and the like, the addition of a larger color monitor would prove next-to-impossible.

Summary

A thoughtful and convenient feature of Home Base furniture is that NO module kit arrives in a package greater than 20 lbs. This certainly helps any cash-and-carry policy and allows the user to manage many modules without fear of permanent physical injury. Also, for those who purchase two or more modules, a free six-plug power strip is included in the purchase price. Prices for the reviewed modules are: Basic Cube, \$169; Hutch, \$159; Cupboard, \$295; and Pull-Out Keyboard Tray, \$44.

Home Base has provided easy construction, friendly documentation and more than adequate storage space with their workstation modules. Their pricing places these modules within the affordability zone of most users. These units would be suitable for both office and home use.

HOME BASE FURNITURE

FEATURES	9
PERFORMANCE	9
INSTALLATION	7
EASE OF USE	10
DOCUMENTATION	N/A
SUPPORT	10
COMPATIBILITY	10

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PERIPHERAL SOFTWARE

P.S.

Note: The following product announcements are supplied directly by the product manufacturers. The CAP Magazine editorial staff assumes no responsibility for the claims made in such announcements, nor is the information based on staff evaluations.

Peripheral software allows you to dictate to your accessories and other critically needed attachments the manner in which they should accomplish their work. One reason for CAP's inclusion of peripheral software in what might have been viewed as a strictly hardware-oriented publication is to show that, in many cases, the software driving the peripheral is as important as the peripheral itself.

Such software is certainly varied. Word processors, data bases and spreadsheets can be included in this department, as well as disk analyzers and software that drives printers. The users' commands embedded in these products are communicated to color or phosphorous monitors, modems, printers, cameras and plotters. Such programs actually control the peripherals and produce the final work which must give the user and his or her company the finest results possible.

The following software releases we feel merit your attention. Hopefully, within the not-too-distant future, CAP will be able to review each offering. At least, after reading about it here, a "test run" at your local computer store might be in order.

Easy Transfer

DISK+, from Portable Computer Support Group of Dallas, TX, allows your Radio Shack Model 100 computer to use an adjoining computer as a disk system. File transfer is immediate to or from the Model 100 to the companion system with an RS232C plug being the only hardware required. No monitor is needed, only the Model 100 display. **DISK+** is loaded via cassette into the 100 and via disk into the companion

computer. By accessing the 100's RAM directory you have access to the companion computer's disk drive, either for loading or storing files. The program works with the Model 100 modem, as well. Price is \$69.95 for both cassette and disk. **Circle No. 315**

IBM Data Base Manager

The Small Computer Company of New York has released *filePro 16*, a data base program for the IBM PC/XT, the Radio Shack 2000 and other MS DOS-based microcomputers. It costs \$395. A first time user can set up a simple electronic filing system in minutes with automatically created screens and reports. Menu-driven, and written in plain English, the system boasts relational capabilities which allow for data transfer between files. The program can maintain up to 16 million records per file, 999 fields per record and up to 4,608 characters in each record. The Apple IIe version retails for \$199. **Circle No. 316**

Making it Legal

TRS80 Model 12 microcomputers may now be even more of an asset to the legal profession. Radio Shack has announced the release of *The Precedent*, a legal accounting system that integrates time and billing, general ledger and cash disbursements. Designed for use by law firms or the sole practitioner, *The Precedent* tracks the billing hours of up to 50 people. Eight billing formats are available. A hard disk is recommended. The retail cost is \$795 for the manual and diskettes. **Circle No. 317**

Piracy Protection

Protection from piracy for IBM and compatibles is a concern recently addressed by Softguard Systems of San Jose, CA, with the release of its protection system. It is a highly sophisticated, software-based system that requires no external hardware device or separate manufacturing process. All copy-

buster products have, to this date, failed to penetrate this protection system. The integrity of protected programs is also maintained when transferred to the IBM XT hard disk. Interested parties should call the company for price information. **Circle No. 318**

Macintosh Utilities

A software utility program of use to Macintosh computer users has been released by Basic Business Software of Las Vegas, NV. This package contains eight utility programs, one of which provides a cross-reference for all variables in an MS-Basic program. Another program allows for both HEX and ASCII file dumps while others remove or rename files. The retail price is \$45.

Circle No. 319

On-line Mobility

Features not normally found on a single communication software disk are included in *APPLE SOURCELINK*, a new release from Source Telecomputing Corp. for the Apple II, IIe and II+ computers. Designed to supplement the use of The Source by personal computer users, *APPLE SOURCELINK* includes automatic dial-up and sign-on for Telenet, Uninet and Sourcenet networks, a "one-button" access to the major services on The Source, simultaneous capture of data from The Source into the Apple memory or disks (including a capture editor), and simplified transfer of data to or from Apple disks to The Source while on-line. Retail price is \$49.95. **Circle No. 174**

dBase for Tandy 2000

One of the best-selling relational data base management systems, *dBASE II*, has recently been released by Ashton Tate for the Tandy 2000. *dBASE II* handles data maintenance, report generation, accounts payable, inventory, personnel, and customer, payroll and mail-

Continued on Page 95

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PERIPHERAL SOFTWARE

Continued from Page 93

ing lists. The user is able to write programs with fewer lines of code and in a shorter period of time than with other high-level languages. The list price is \$595. **Circle No. 320**

Versatile WP for IBM

A new word processing program named *Freestyle* for the IBM PC and compatibles has been released by Select Information systems of Kentfield, CA. The program contains a line drawing feature for charts and forms and also possesses an extensive outline capability. An integrated spelling checker, a mail list merge, a Wang-like glossy feature called Keyfiles, plus an on-screen interactive tutorial round out *Freestyle*. All of IBM's special character sets are supported with on-screen enhancements and horizontal scrolling. Suggested retail price is \$295. **Circle No. 277**

Sending it Faster

Electronic Computer Originated Mail (E-COM), operated by the United States Postal Office, may now be simplified through use of a new product called *E-COM/International*. ADD Engineering Corp., of Carson, CA, states their product can quickly create and send personalized form letters, invoices, account statements, news releases, surveys and other correspondence via E-COM and that such mail delivery is accelerated when using *E-COM/International*. Even inexperienced operators are aided through E-COM's procedures due to menus and other aids provided with the program. MS DOS and CP/M versions are available for \$395.

Circle No. 178

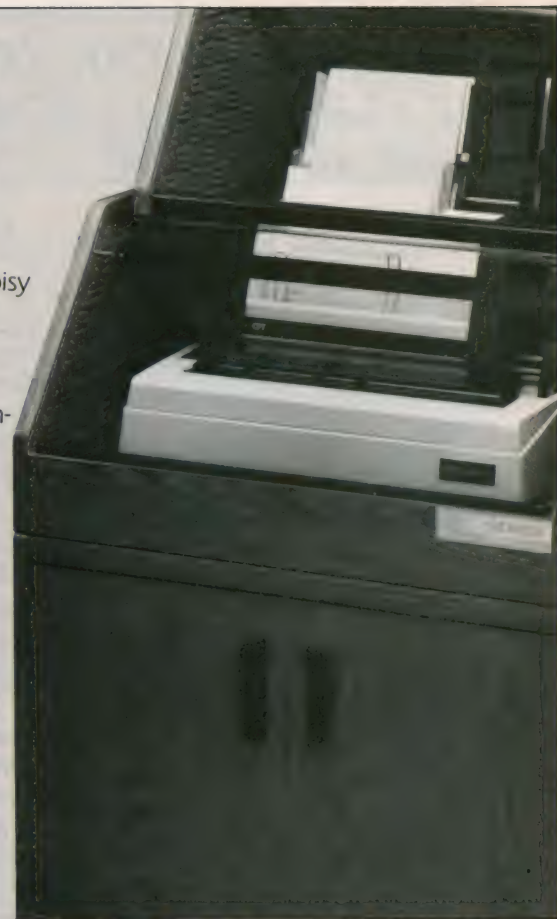
1-2-3 for HP

Lotus 1-2-3 has now been released for the Hewlett Packard Portable Computer, according to Lotus Development Corp. of Cambridge, MA. This version of 1-2-3 is built into a read-only memory (ROM) chip which makes this portable computer the first to utilize software on a chip technology. This was a joint venture of both companies. 1-2-3, a built-in modem and a word processor are all standard ROM inclusions in the HP Portable Computer. **Circle No. 276**

SONEX Printer Covers

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ENHANCED BANK STREET WRITER: WP VERSATILITY FOR APPLE

By Hartley G. Lesser

System Requirements

Apple IIe with extended 80-column card*
or Apple IIc

DOS 3.3

One disk drive

Mouse (optional)

*See comment under installation

Simplicity is a most desirous state. Far too often, the programs we deal with in a business environment tend toward complexity — in turn, leading to user frustration and anger at the manufacturer.

Enter Bank Street Writer is New Enhanced Version. For many, this word processor will provide the power and versatility long sought.

Features

The enhanced version of Bank Street Writer has features found in the more mature word processor. Both 40- and 80-column modes are supported on an Apple IIe. Easily understood commands are always present at the top of the screen. A press of the ESC(ape) key manages just that — escape to the initial screen from an area in which the user has become lost or confused.

As many as 16 printer commands can be utilized in your text, including underlining and boldface. However, these capabilities are dependent upon the user entering the appropriate ASCII codes into a printer setup Utility Program. This capability gives this enhanced version business capability. Macros representing the specific function are entered into your text directly and are recognized by the computer but are not shown on your final hard copy. All files are stored in binary format. This means that should you wish to telecommunicate materials created by BSW, you'll probably have to convert them to a text file format first. Thankfully, Broderbund has provided such a program with their word processor in the utility program. This

program also preserves upper- and lower-case, if you wish.

Data disks can be initialized without leaving the word processing program, page breaks can be indicated, and last, but certainly not least, Bank Street Writer offers an interactive tutorial on the flip side of the program disk that should have any novice user up and using the word processor in less than 20 minutes.

Installation

If you happen to own a new Apple IIc, there is no installation required. The word processor will run in either 40- or 80-column mode depending upon the setting of the IIc video switch.

For IIe owners, however, certain criteria must be established before 80-column mode is possible. First, the IIe motherboard — the large, green, printed circuit board that lays in the bottom portion of your computer — must be designated as "B" motherboard. This can be determined by viewing the number in the upper left portion of the board. If the number ends with the letter "B," you're halfway home.

Your 80-column extended card must have a two-pin jumper block installed over the two pins at location J1. This area is located toward the lower right front of the board as you look at it from a keyboard vantage. This is not a complex operation. A simple alligator clip can be used by opening the clip and fastening the metal jaws over both pins at location J1. This insures the 80-column, double high-resolution display. If this is not completed, the only mode available will be the 40-column mode.

Support

There is no toll-free telephone number for product support. Neither is there any mention in the documentation of any support procedure should you

have questions regarding BSW. On the inside cover, Broderbund's telephone number in San Rafael is listed. A call to this number provided me with an extremely courteous receptionist who made an immediate transfer of my call to Customer Service. Again, another pleasant company representative politely discussed a technical problem with me and, although she couldn't solve the question while I was on the telephone line, she recorded my telephone number and name and promised a return call solving my dilemma. Two hours later the promised call was received.

Performance

The Function Menu's top four lines consist of prompts. These prompts allow access to the functions. Also included in this prompt area are "need-to-know" messages. For example, while in the WRITE mode, the message will read "PRESS ESC FOR EDITING FUNCTIONS." My preference happens to be with a word processor that allows for editing while in the WRITE mode. With BSW, you must leave WRITE mode with a tap of the ESC key, edit your material, and then re-enter the WRITE mode to continue your masterpiece.

Ease of Use

Extremely simple to use, BSW offers full word processing power with little memorization of codes required. For example, suppose you had entered specific printer codes for such features as underlining or boldface. By entering Open or Closed Apple-P, a window appears on screen containing the macros you designated as specifics for printing features. Selection by number then places that macro highlighted into your text. The feature is printed on your hard copy, but the macro is not.

Error Handling

All errors are adequately trapped and explained to the user. I was unable to crash the program except via repeated pressing of both the CTRL and RESET keys. The character buffer was never overloaded and no characters were dropped on screen regardless of typing speed.

Documentation

The documentation consists of a 56-page handbook which adequately covers the use of the word processor, advanced features, and use of the Apple Mouse; it includes a glossary and index.

Compatibility

Bank Street Writer is compatible with an Apple IIe with an extended 80-column card with a jump block installed over the pins at location J1. This word processor is also compatible with the new Apple IIc transportable computer. Printers tested with Bank Street Writer were the Apple Imagewriter and Scribe.

Summary

For those who would like to utilize a word processor for both a small- to medium-sized office or the home, Bank Street Writer deserves investigation. For those accustomed to different built-in fonts, special printing capabilities, mailing list detailing and extraordinary text justifications, BSW may be too simplified a product. Heavy office work also is not in BSW's jurisdiction.

BANK STREET WRITER

FEATURES	8
INSTALLATION	10 (IIc) 7 (IIe)
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PERFORMANCE	9
EASE OF USE	10
ERROR HANDLING	10
DOCUMENTATION	9
COMPATIBILITY	10

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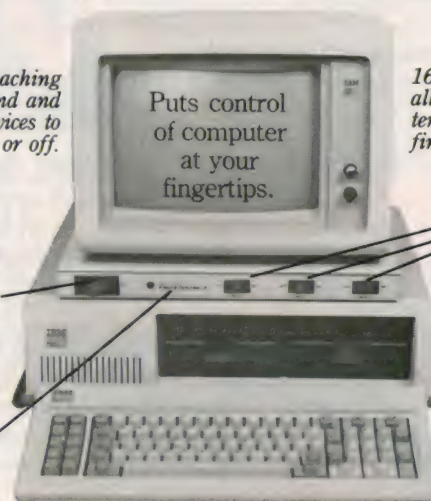
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Computing Terms In This Issue

Baud Rate Measurement of speed for information transmission. Common speeds include 300, 1200 and 2400 baud. Bits per second is a more technically correct term.

Bit Abbreviation for binary digit. Smallest unit of information handled by computers. Also called "zeros" and "ones."

Bucket An expression used to indicate some portion of storage specifically reserved for accumulating data or totals.

Buffer An auxiliary data storage device which holds data temporarily and sends it to your printer, freeing your terminal for use.

Byte Collection of bits into meaningful groups. A measureable portion of consecutive binary digits, e.g., an 8-bit or 16-bit byte.

CP/M Acronym for Control Program for Microcomputers. A popular disk operating system used by many manufacturers. A trademark of Digital Research Corporation.

CPS Acronym for characters per second. A measurement of speed of character transmission or printing.

CPU (Central Processing Unit) The computer chip that performs the actual "computing" function. All other components in a computer interface with the CPU.

CRT Acronym for Cathode Ray Tube. Device for displaying characters and graphics. Also called a monitor, a video display, or screen.

Data Encryption Standard A method of data protection developed by IBM and accepted by the National Bureau of Standards that uses a single "private key" to encrypt data.

Disk Operating System (DOS) A program used by the computer to read, write and catalog disk files. Examples

include MSDOS, CP/M and TRSDOS.

Embedding Placing special printer commands within the text as instructions.

Emulate The ability of one system to imitate another, with the imitating system accepting the same data and programming and achieving the same results as the imitated system, but possibly with a different time performance.

Expansion Slots Sockets located within the computer into which additional circuit boards can be plugged.

FIFO Key (First In First Out) A method for storing and retrieving items. For instance, with a print buffer the first items sent into the buffer are the first sent to the printer.

Interface Card Type of expansion board that permits connection of external devices to computers. Examples include Serial Interface Cards, Disk Interface Cards, etc.

Interfaces Connections between compatible computer devices through which information is exchanged.

Internal Modems Modems that plug directly into computer expansion slots inside the computer.

I/O Port Connection location for devices used to communicate with the computer.

K A symbol used to indicate memory capacity, equivalent to the numeral 1024. For example, 8 K would be equivalent to 8192.

Memory Board Expansion board that adds Random Access Memory to the computer system, making it possible to store and use the additional information.

Modems Devices which connect computer and telephone lines, making it possible to send computer information via telephone lines.

Multifunction Board Device that plugs into computers, giving the system more than one new capability (i.e., clock/calendar, memory expansion board).

NRC (Noise Reduction Coefficient) A figure that indicates how much noise a panel will absorb. The higher the rating, the more noise will be absorbed.

Parity Relates to the maintenance of a level or count such as keeping the same number of ones in a computer word to perform a check based on an even or odd number for all words examined.

Pink Noise The type of noise generated by air conditioning and ventilation systems. It decreases in a predictable ratio at higher frequencies to distract workers from unexpected noises.

Ports Sockets used by computers to pass data to and from other devices. There are different types of ports. Serial ports pass information one "bit" at a time. Parallel ports pass multiple bits of information, usually one "byte" at a time.

RAM Acronym for Random Access Memory. This is where computer memory is temporarily stored.

RS232C An engineering specification for cables, connectors and signals. In theory, products designed around these specifications can be plugged together.

Telecommunications The system that enables computers to converse (transmit/receive data) through hard wires or telephone lines.

Unix A multiprogramming operating system developed at Bell Laboratories that features sophisticated software and text developing utilities.

White Noise Continuous noise produced over all audible frequencies to "fill-in-the-gaps" between discontinuous office distractions such as printers, keyboards and footsteps.

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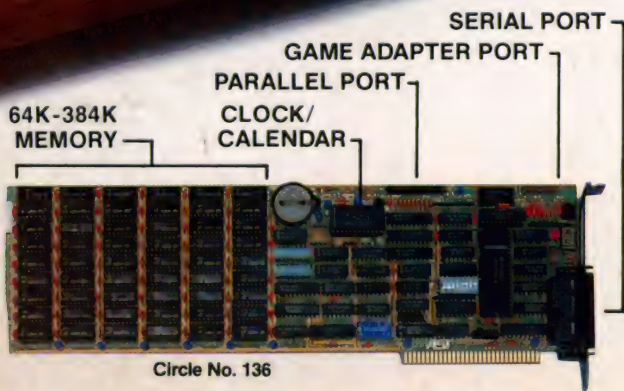
taining AST's high standards for quality and reliability.

The **SixPak**, as we like to call it, could have been named for the six banks of RAM on it. However, we like to think that it was named for the six functions of the card. The features of the **SixPak** include:

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3. One Parallel (printer) port, configurable as LPT1 or LPT2 (LPT2 or LPT3 when the IBM monochrome card is installed), for use with the IBM/Epson and other compatible printers. The port is compatible with IBM diagnostics.
4. A Clock-Calendar with battery backup, featuring an easily replaceable Lithium battery and a quartz-controlled timebase for a high degree of accuracy.
5. An optional IBM-compatible Game Adapter port, for use with an IBM-type joystick. In conjunction with application programming, this game port may be used for cursor control, in generating graphics or for playing games at the end of your work day!
6. Every **SixPak** comes with an AST SuperPak utility diskette which includes SuperDrive and SuperSpool, the most powerful disk emulator and print spooler software you can get. These programs will greatly enhance the throughput of your PC or PC-XT by emulating disk drive and printer access at RAM speeds rather than the normal slower speed of mechanical devices. SuperPak is the first of such software to be compatible with both DOS 1.1 and DOS 2.0.

Most important of all, the **SixPak** comes with the AST "Plus," AST's unsurpassed reputation for quality, reliability, after-the-sale support, and overall design excellence that gives our products the best price/performance ratio in the industry! Hence the name, **SixPakPlus!**

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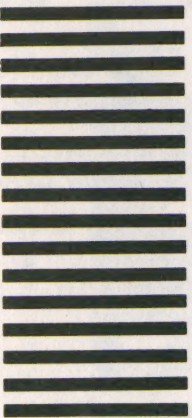
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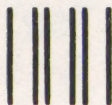
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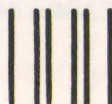
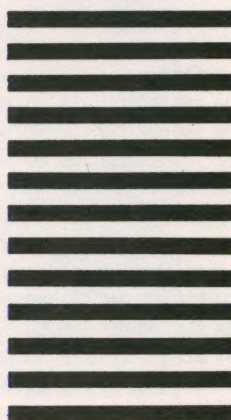
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